1994 Index

1/1A ESS™ switch **6**, 24, 94
101 ESS switch **6**, 24
1992 Telecom **6**, 72
1A processor **6**, 64
1B processor **6**, 93-97, 99
1B24 processor **6**, 64
2NCP (network control point) **6**, 43
3600 Surity™ secure telephone **5**, 20
3B20D, 3B21D administrative module (AM) **6**, 32, 36
3B21 processor **6**, 64, 65
4A Crossbar switch **6**, 24
4ESS™ switch **3**, 49, 54; **6**, 6, 40, 42, 43, 64, 93-100: 1A processor **6**, 94; 1B processor **6**, 94; Announcement Administration Processor **6**, 94; asynchronous transfer mode (ATM) **6**, 98; A-I-Net™ **6**, 99; automatic speech recognition **6**, 98; broadband multimedia **6**, 98; common channel signaling (CCS7) **6**, 94; common network interface (CNI) ring **6**, 94; customer interface platform **6**, 94; digital interface **6**, 94; integrated services digital network (Q.931) **6**, 94, 98; DS3 protection switching **6**, 97; echo canceller **6**, 97; network clock (rubidium oscillator) **6**, 94, 97; Network Services Complex **6**, 98; Office Data Administration System (ODMS) **6**, 96, 97; operations, administration, maintenance, and provisioning (OAM&P) **6**, 93, 94; overview **6**, 93, 94; Service Circuit System **6**, 94; space division centerstage switch **6**, 97; switching fabrics platform **6**, 94; (OAM&P) **6**, 93, 94; time multiplex switch **6**, 94, 97, 98; SONET interface **6**, 97; time slot interchanger **6**, 94, 97;
5ESS®-2000 switch **2**, 50; **3**, 54; **4**, 29, 32, 58; **6**, 4-6, 7, 8, 24-26, 28-38 (*see also* 5ESS®-2000 cellular switch *below*): architecture **6**, 25, 26, 28-38; components **6**, 28-38; 3B20D, 3B21D administrative module (AM) **6**, 32, 36; and advanced services platform (ASP) **6**, 46; and asynchronous transfer mode (ATM) **6**, 32, 52; best-in-class process **6**, 35; built-in self test (BIST) and boundary scan **6**, 34; call completion rate **6**, 35; communications module (CM) **6**, 36; compact digital exchange (CDX) **6**, 33; Digital Networking Unit-SONET/SDH (DNU-S) **6**, 32, 36; earthquake protection **6**, 33; electromagnetic compatibility (EMC) **6**, 34; evolution of interfaces (ISDN, IN, wireless, SONET/SDH) **6**, 26; exceeding customer expectations **6**, 28-38; extended switching

Legend: Issue number is bold face **1**
Page number is regular face 1
* *Corporate marks at end of index*
AT&T marks indicated by ™ SM ®

5ESS®-2000 switch *(continued)*
module (XSM) **6**, 31-33; Global Configurator **6**, 34; hardened remote integrated-services line unit (HRISLU) **6**, 33; intelligent network features **6**, 30; and integrated services digital network (ISDN) **6**, 25, 30-33, 36; integrated services line unit (ISLU) **6**, 25, 33; manufacturing **6**, 6; **6**, 62-70; multimedia support (*N x* 64) **6**, 32; OAM&P **6**, 28, 30, 31, 32, 42, 43; operator service position system (OSPS) **6**, 30; original architecture **6**, 24; platform **6**, 5, 28-38; protocol handler **6**, 25; quad link packet switch **6**, 32; remote integrated-services line unit (RISLU) **6**, 33; remote line groups (RLG) **6**, 33, 36; remote line interface **6**, 32; remote switch module (RSM) **4**, 58; **6**, 31- 33; stability run **6**, 35; SONET **6**, 30, 32; switching module (SM) **6**, 32, 34, 36, 37, 63; synchronous digital hierarchy (SDN) **6**, 30, 32; testing **6**, 34; time slot interchanger, expanded **6**, 30, 34; very compact digital exchange (VCDE) **6**, 32; and voice recognition call processor (VRCP) **6**, 46; wireless switching **6**, 6
5ESS®-2000 cellular switch **6**, 55-61: digital cellular switch (DCS) **6**, 58, 60, 61; DSC-1800 **6**, 61; digital facility interface (DFI) **6**, 60; frame-relay protocol handler **6**, 59, 60; packet pipe **6**, 60; packet switch unit 2 (PSU2) **6**, 59-61; and personal communications services **6**, 55, 61; protocol handler for ATM (PHA) **6**, 59-61; protocol handler for voice (PHV) **6**, 59, 60; time slot interchanger **6**, 60; and wireless communications **6**, 55, 61;
5XPRESS® **4**, 44
800 Service **3**, 48, 55; **4**, 96; and speech recognition **6**, 19, 45;
92010 Hobbit chip **3**, 16

A

"A Directory-Assistance Preprocessor Using Speech Recognition" **3**, 3
Abstract syntax notation **3**, 5, 25: MACRO Replacement Notation **3**, 66-79; -based protocols for encoding rules **3**, 80-93
Accelerated testing **2**, 78
Access: control list (ACL) **5**, 47; fiber-based **6**, 19, 20; technologies **3**, 19; wireless **6**, 19, 20
Accunet® Packet Service **4**, 70
ACE reporter generator (INFORMIX) **4**, 51, 62
"Achieving Customer Satisfaction Through Robust Design" **1**, 48-58
Achieving Process Excellence (APEX) **1**, 14, 17-25, 48-55
Ackroff, J. M. **3**, 3
Active badge locations **5**, 31
"Adaptive Bandwidth Allocation for ATM Networks" **1**, 2
Adaptive delta pulse code modulation (ADPCM) **4**, 98
Adaptive differential pulse code modulation (ADPCM) G.721 **3**, 29
Adjunct processor (AP) in intelligent networks (IN) **6**, 41- 43
Adleman, Len **5**, 20, 21, 49
Administrative module (AM) 3B20D, 3B21D, 5ESS® **6**, 32, 36
Admiral Yamamoto **5**, 4
Advanced communications package (ACP) **6**, 43
Advanced mobile phone service (AMPS) **3**, 17; **6**, 55, 58
"Advancing Programmable Gate Arrays" **6**, 2
Advanced Research Projects Agency (ARPA) **5**, 45, 56
Advanced services platform (ASP) **6**, 43
Advanced Software Construction Center (ASCC) **4**, 35-37, 41-45
African undersea fiber-optic network **6**, 3
Agrawal, Vishwani D. **2**, 30-39
A-I-Net™ **6**, 43, 44: and 4ESS™ switch **6**, 99
Akyn, Nuray A. **4**, 14-21
Alcatel **4**, 56: 1240 **4**, 62; Q-interface adapter (QIA) **4**, 64; Q3LTS protocol **4**, 64; remote Q-interface adapter (R-QIA) **4**, 64
Allen, Jr., Robert W. **2**, 56-65
Allen, Woody **5**, 14
Allied codes **5**, 4, 5, 17
"All Optical Undersea Transmission" **6**, 3
Alternate current (AC) **4**, 22
American Association for the Advancement of Science **5**, 73
American National Standards Institute (ANSI) **3**, 27 (*see also* Standards, ANSI)
American Transtech **3**, 47
Amoroso, Edward **5**, 40-51, 57
"An Analysis of Universal Multimedia Switching Architectures" **6**, 81-92
"An Engineering Approach to Secure System Analysis, Design, and Integration" **5**, 40-51, 53
"An Introduction to Cryptanalysis" **5**, 24-29
"An Introduction to the ASN.1 MACRO Replacement Notation" **3**, 66-79
Analog testing **2**, 7, 8
Analog, design-for-test **2**, 49-55
Anderson, Thomas W. **6**, 93-100
Andrew File System **3**, 40
Announcement Administration Processor, 4ESS™ switch **6**, 94, 98
"Anonymous Credit Processes Explored" **5**, 3
ANSI: 1149 (*see* IEEE 1149); boundary-scan standard **2**, 7
Answer to reset (ATR) **5**, 63

APEX (see *"Achieving Process Excellence"*)
Apple Computers **5**, 22: Newton* **3**, 17; Power Macintosh* **2**, 2
Application gateways **5**, 57, 58
Application protocol data units (APDU) **3**, 66-70, 74-77
Application specific integrated circuit (ASIC) **2**, 11, 12, 25, 37, 38, 58; **5**, 62, 63, 65; **6**, 34
Application-oriented languages (AOL) **6**, 44
Applications processor (AP) **6**, 43, 44
Applications program interface (API) **4**, 5
Architecture reviews **4**, 42
Architecture, distributed switching trends and concepts **6**, 19-27; multimedia switching **6**, 81-92
"Architectures for Switch-Control Software" **4**, 2, 3
Argon sputtering **3**, 108
Armed forces **5**, 6
Arms, Allen L. **6**, 62-70
Arrays, ball grid **2**, 47
Artificial intelligence **4**, 14
ASCII **3**, 32, 35, 36, 38, 40, 61; **4**, 103; **5**, 25
ASN.1 (*see* Abstract syntax notation)
Assembly language, non portable **5**, 35
Assessment **6**, 10, 12
Assignment **1**, 73
Assignments, logic value **2**, 20
Asymmetrical cryptosystems, **5**, 35
Asynchronous terminal **4**, 82
Asynchronous transfer mode (ATM) **4**, 9, 46; **6**, 4-6, 19, 20, 23, 25, 26, 32, 42, 71, 79, 80, 81, 89-91: and 4ESS™ switch **6**, 98; access node **6**, 49; adaptive bandwidth algorithm **1**, 2; AT&T switching products **6**, 48, 55; center-stage interconnect platform **6**, 60; cells **6**, 50; comparison with other technologies **6**, 89-91; growable packet switch architecture **6**, 79; integrated services platform **6**, 49; and multimedia (audio, data, video) conferencing **4**, 97-108; **6**, 81-92; network constraints with multimedia **4**, 97-108; **6**, 81-92; service node **6**, 49; service-management module **6**, 49; - STM conversion **6**, 51, 52, 91; switched-services module **6**, 49-50; virtual path **6**, 50
AT&T:
1/1A ESS™ switch **6**, 24, 94
101 ESS switch **6**, 24
1A processor **6**, 64
1B processor **6**, 93-97, 99
1B24 processor **6**, 64
2NCP (network control point) **6**, 43
3600 Surity™ secure telephone **5**, 20
3B20D, 3B21D administrative module (AM) **6**, 32, 36
3B21 processor **6**, 64, 65
4A Crossbar switch **6**, 24
4ESS™ switch (*see* 4ESS™ *listed above*)
5ESS® switch (*see* 5ESS®-2000 *and*
AT&T: *(continued)*
5ESS®-2000 cellular switch, *both listed above*)
5XPRESS® **4**, 44
800 Service **3**, 48, 55; **4**, 96; and speech recognition **6**, 19, 45;
92010 Hobbit Chip **3**, 16
Accunet® Packet Service **4**, 70
Air-to-Ground Service **3**, 55
American Transtech **3**, 47
and secure communications **5**, 6
and system security **5**, 52-60
A-I-Net™ **6**, 43, 44
Automatic Call Distributor (ACD) **3**, 46, 48
BaseWorx™ applications platform **4**, 7-10, 18, 37, 39, 67, 68
Bell Laboratories **3**, 5; **4**, 2, 89, 94; **5**, 2, 3, 7, 22, 54, 58; **6**, 2, 3, 35, 45, 67
Bell Laboratories Engineering Research Center **2**, 50-53
BNS-2000 data switch **4**, 11, 46-55
Business Communications System (BCS) **1**, 3, 7, 45
Call Accounting System (CAS) **4**, 86, 89
Chairman's Quality Award (CQA) **1**, 17; **6**, 12
Communications Services Group (CSG) **6**, 54
ComputerWatch® Audit-Trail Analysis Tool **5**, 57
Conversant Voice Information System (CVIS) **3**, 46, 48-50
Corporate Information Office **1**, 15
Corporate Quality Office **1**, 7
Cymbal™ **4**, 24
DACS: element management system (DEMS) **4**, 78; DACS II system **4**, 57, 60, 61; DACS III system **4**, 70, 72, 73, 75-77; - 2000, and expert configurators **1**, 72-74, 77
DACSCAN-2000 Controller C-Module **4**, 59, 60, 62, 64, 68
Databaseless Security System **5**, 67
Datakit® virtual circuit switch **4**, 30, 32, 67: BELGACOM's **4**, 64
DDM-2000, and PROSE **1**, 79
DEFINITY®: and AUDIX® integrated functionality **3**, 62; and AUDIX® voice mail system **3**, 4-6, 57-65; disk/alarm board (ALB) **3**, 58, 60; fault management system **4**, 92, 94, 95; G.2 PBX **3**, 4-6, 46, 48, 49, 51, 57-65; **4**, 12; G1 and G2 PBXs **3**, 61; G2 and G3 **4**, 83-87, 89-94, 96; G3 management application (G3-MA) **3**, 62, 63; **4**, 86, 87, 89, 94; management of **4**, 82-96; multifunction board (MFB) **3**, 58-60, 62; time division multiplexing (TDM), **3**, 57
Denver Works **3**, 59
Dimension® PBX **4**, 82, 83; Maintenance
AT&T: *(continued)*
and Administration Panel (MAAP) **4**, 82; procedures (procs) **4**, 82, 83
Distributed Systems Research Department **5**, 73
DSP-32C processor **3**, 58, 59
EasyLink® Service **3**, 19
Engineering Research Center (ERC) **2**, 50, 52, 53; **6**, 80
EO® Personal Communicator **3**, 17, 19
FT Series G **4**, 70, 72
General Business Systems (GBS) **1**, 37, 45
Global Business Communications System (GBCS) **1**, 36, 41, 42, 45; **4**, 7, 85-96: Technical Service Center **4**, 7, 88
Global Information Solutions (GIS, formerly NCR) **1**, 45; **2**, 45; **3**, 15, 19; **4**, 7, 96; **5**, 43
Global Information Solutions StarSentry system™ **4**, 92: and BELGACOM **4**, 64-66
Global Engineering and Control Center **6**, 69
GlobeView™-2000 Broadband System **6**, 4, 26, 49, 52-54; AXC **6**, 52, 53; GCNS **6**, 53; BSS **6**, 53
Gretag Data Systems **5**, 11
Information Systems Development **6**, 67
Information Vending Encryption System (IVES) **5**, 12
Intelligent Network (IN): service initiatives **6**, 19; service processing systems **6**, 39-47
Internal Quality Audit **1**, 19
International Operations Division **6**, 53
InterSpan services **6**, 54
Intuity™ AUDIX® **3**, 57, 61
Mail **5**, 57
Message Service **3**, 4, 6, 46-56
Microelectronics **1**, 3, 56, 75; **2**, 3, 37; **3**, 109; **6**, 2
MLS/TCP program **5**, 58
MLS/Xwin **5**, 59
NetWatch™ Trusted Security Gateway **5**, 58
Network Audit Analysis System (NAAS) **5**, 57
Network control point (2NCP) **6**, 43
Network mediation unit (NMU) **4**, 57, 60, 62, 64
Network Operations Center (NOC) **4**, 7, 30
Network services complex (NSCX) **6**, 43
Network Services Division (NSD) **4**, 11, 22-28, 74, 88: Operations Center **4**, 25
Network Services Group (NSG) **6**, 49, 52, 54
Network Systems **4**, 10, 29, 96; **6**, 20, 33, 34, 54, 68
Network Systems Belgium **4**, 10, 56

AT&T: *(continued)*
Network Systems Group **6**, 4, 6, 10
Network Systems, and PROSE and Classic **1**, 69-80
Oklahoma City Works **6**, 36
OneVision™ Network Management Solutions **4**, 82, 92, 95
Operations Systems Business Unit (OSBU) **4**, 4-10, 20, 29, 35: Display Construction Set **4**, 10; Major Account Centers **4**, 6
Operations Systems interface design **4**, 14-21
Paradyne **1**, 45
Power Systems **1**, 3
Quality Library **1**, 7
Quality Policy **6**, 7
RCA Best Current Practices Handbook **6**, 12
Remote network mediation unit (RNMU) **4**, 64
SatWatch **5**, 57
Secure Communications Systems Business Unit (SCSBU) **5**, 6: Development Laboratory **5**, 12
Secure Systems Engineering Department **5**, 43, 52, 54, 58
Skynet® Clearlink Service network **4**, 70-72, 75, 76, 78
SLC®-2000, and PROSE **1**, 79
Smart Card **5**, 7, 8, 61-72
Software Technology Center **1**, 62
StarKeeper® II NMS (Network Management System) **4**, 11, 46-55: and BELGACOM **4**, 64-66; Graphics System **4**, 47-50, 52; network architecture, Graphics System, Network Monitor **4**, 47, 48, 49, 52-54; network architecture, Graphics System, Network Builder **4**, 46, 48, 49, 52, 53; network architecture **4**, 46; network architecture, Core System **4**, 47, 49-52, 54; network architecture, Graphics System, Performance Reporter **4**, 48, 49; Performance Monitor **4**, 46, 53; Programmer's Interface (PI) **4**, 52
StarLAN® **3**, 46, 51; **6**, 88
StarSentry system™ **4**, 92: and BELGACOM **4**, 64-66;
StarServer® FT **4**, 67
Surity™ Data Network System **5**, 58; 3600 secure telephone **5**, 20
Switching Systems Business Unit (SSBU): and RUNBIST **2**, 43; and manufacturing **6**, 62-70; and Total Quality Management **6**, 7-18
"AT&T ATM Switching-Network Products" **6**, 48-55
"AT&T Switching Technology: An Overview" **6**, 4-6
System 75 PBX **3**, 61; **4**, 12, 83, 85

AT&T: *(continued)*
System 85 PBX **4**, 83, 85
System V/MLS operating system **5**, 52, 53, 57, 58
Tapdance™ **2**, 37, 38, 42
Telecommunications Relay Service **3**, 55
Telemetry asynchronous block serial (TABS) protocol **4**, 64
Total Quality Approach **1**, 9
Total Quality Management **6**, 5, 7-18
Transmission Systems Business Unit (TSBU): and APEX **1**, 14 17, 22-25; and ISO 9000 **1**, 17-22, 25; Malcolm Baldrige Award **1**, 8, 49; and quality planning matrix (QPM) **1**, 49, 51, 52, 55; and robust design **1**, 48-58; and RUNBIST **2**, 43; SSRD robust design **1**, 48-58
True Messaging **3**, 46
USA Direct Service **3**, 48, 55
V32MX modem chip **3**, 16, 17
WaveLAN® **3**, 15
Atmospheric pressure chemical-vapor deposition (APCVD) **3**, 98, 99, 102, 105, 106, 109
ATM (*see* Asynchronous transfer mode)
ATTDFT test product **2**, 19, 35-37, 59, 61-63
ATTSIM **1**, 56
Attendant assistance **3**, 50, 51
Audio broadcasting system, digital (DAB) **5**, 3
Audio conferencing **6**, 81-86, 88-91; and ATMs **4**, 97-108
Audio with full-duplex interruptability **4**, 98
AUDIX® Release 1 **3**, 57, 62; voice mail **3**, 4-6; and text-to-speech synthesis **2**, 2; Voice Messaging Service **4**, 87, 88; Data Exchange System **4**, 86, 89, 91; and DEFINITY® voice mail system **3**, 4-6, 57-65
Authentication **5**, 32, 46, 47, 58, 66, 67, 69: methods **3**, 10
Authenticator, hand-held **5**, 47
Authoritative electronic transactions **5**, 9-16
Automated setup **3**, 50
Automatic Call Distributor (ACD) **3**, 46, 48
Automatic message accounting (AMA) **3**, 49, 54, 55
Automatic number identification (ANI) **3**, 50, 55
"Automatic Scene-Change Detection" **2**, 2
Automatic speech recognition (ASR) **6**, 44-46: and 4ESS™ switch **6**, 98
Automatic teller machine **5**, 69
Automatic test equipment (ATE) **2**, 40, 56, 60, 62, 63
Automatic test generation (ATG) **2**, 23, 27, 28
"Automatic Test Generation for Digital Electronic Circuits" **2**, 19-29
Automatic Test Pattern Generator (ATPG) **2**, 19-21, 23, 24, 26, 28, 32
Availability of data service **5**, 10, 14, 15
Avalanche photodiode (APD) **2**, 68-70
Axis codes **5**, 4, 5, 17
AZERTY keyboard **4**, 66

B

Back algorithm **2**, 21
Bailey, Susan R. **1**, 17-25
Baldrige National Quality Award **1**, 6-8, 13, 17-19, 49; **6**, 7, 9, 12
Ball grid arrays **2**, 47
Ballistic Missile Defense Organization (BMDO) **5**, 40
Bandwidth allocation for ATM networks, adaptive **1**, 2
Banyan network **6**, 77
Barbier, Susan **4**, 82-96
BARCO Corporation **4**, 65
BaseWorx™ applications platform **4**, 7-10, 18, 37, 39, 67, 68
Basic communications package (BCP) **6**, 44
Basic encoding rules (BER) **3**, 25, 80-93
Basic Security Option (BSO) **5**, 58
Basinger, Ronald G. **6**, 7-18
Battle of Midway **5**, 4
Battle of the Atlantic **5**, 4
BCP (Best current practices) **1**, 26, 27, 32, 33
Beausang, James **2**, 40-48
Becker, Daniel C. **4**, 46-55
Becker, R. A. **1**, 3
Bed-of-nails test access **2**, 56, 58
BELGACOM **4**, 7, 56-68: and AT&T StarKeeper® II system **4**, 64-66; and AT&T StarSentry system **4**, 64, 65; Bureau Central Telephonique (BCTs) **4**, 57, 58, 60: Centre de controle (CC) **4**, 59, 62, 65; Centres de zones (CZs) **4**, 57, 58, 60; Datakit® network **4**, 64; DCS-mail network **4**, 64, 66; Ethernet* network **4**, 64; FTP/TCP/IP network **4**, 64, 67, 68; LAN/WAN network **4**, 64; Local distribution centers (LDCs) **4**, 58, 60; Megapac network **4**, 64; Nationaal Exploitatie Centrum (NEC) **4**, 57; network **4**, 64, 67, 70; Network Operations Center (NEC) **4**, 57; operations management center (OMC) **4**, 58, 59, 62, 65; surveillance districts (SVCs) **4**, 57; Telanet e-mail network **4**, 64; telephony zones **4**, 58; terminating (subscriber) exchanges **4**, 58; transmission infrastructure database (ITR) **4**, 60, 62, 64; X.25 network **4**, 64, 67, 70
Belgium Integrated Operations Center (BINOC) **4**, 10, 56-68
Bell Communications Research (Bellcore) **3**, 43, 54; **4**, 46; proposed ISDN-like wireless interfaces **6**, 56, 57; technical advisories TA-NPL-000145, TA-NPL-001412, TA-TSV-001411 **6**, 57

Bell Laboratories (*see* AT&T Bell Laboratories)
Bell Laboratories President's Quality Award, and FASTAR℠ **4**, 80
Bell-LaPadula model **5**, 57, 59
Bellovin, S. **5**, 58
Bell System **6**, 93
Benchmarking **1**, 37
Benimoff, Nicholas I. **3**, 46-56
Berman, Jay I. **1**, 69-80
Best current practices **1**, 26, 27, 32, 33
Best-in-class products, testing **2**, 10; **6**, 11; 5ESS® **6**, 35
BINOC **4**, 10, 56-68: O&SIS service management system **4**, 61, 62, 65, 66, 68; subnetworks (SN 1-5) **4**, 56, 57; transmission supervision (TM-SUP) **4**, 57, 58, 60
Biometric authentication/identification **5**, 11, 69
Bipolar technology **2**, 30
Bit error rate (BER) **4**, 101, 107; **6**, 81, 84-86
Black Pages, Keynote **5**, 35
Blaze, Matt **5**, 30-39
Block-resist patterning **3**, 109
Blue Book, CCITT **3**, 21
BNS-2000 data switch **4**, 11, 46-55
Boundary-scan: architecture **2**, 40-43; and 5ESS® switch **6**, 34; register **2**, 41, 43; CAD (BCAD) **2**, 37, 38; description editor (BSDE) **2**, 37; description language (BSDL) **2**, 37, 60; insertion/generation (BIST/gen) **2**, 37; net analyzer (BSNA) **2**, 62; merging with BIST **2**, 34; register **2**, 41, 53; standard IEEE 1149.1 **2**, 7, 13, 16, 37, 38, 40, 41, 43, 45, 47, 60; standard, ANSI **2**, 7; standard, IEEE **2**, 7, 13, 16, 27, 37, 38, 40, 41, 43, 45, 47, 60; technology **2**, 7, 13, 14, 16, 32, 34, 37, 40-48, 56, 57, 60, 63
"Boundary-Scan Testing for Electronic Subassemblies and Systems" **2**, 40-48
Boza, Luis B. **1**, 48-58
Bramley, Jeffrey S. **4**, 28
Breakthrough improvement **1**, 9, 12, 37
Breslin, Mary Warren **3**, 57-65
Bridging defects **2**, 28
Bridging, media **6**, 88
"Bringing Photonics to Broadband Switching" **6**, 71-80
Broadband integrated services digital network (B-ISDN) **4**, 102; **6**, 42: digital audio (DAB) **5**, 3; physical and link layers **5**, 34
Broadband switching **6**, 6: multimedia and 4ESS™ switch **6**, 98; technologies **6**, 71-80
Brooks, Thomas A. **5**, 4-8
Building and power systems **4**, 22-28
Built-in self-test (BIST) **2**, 7, 11-14, 16, 23, 27, 30-39, 42-44: and 5ESS® switch **6**, 34; content-addressable memory (CAM) **2**, 34; merging with boundary scan **2**, 34; principals **2**, 31-32; random logic **2**, 13, 14, 32, 36; random logic, pseudo-exhaustive **2**, 32, 33, 36, 37; random logic, pseudo-random **2**, 32, 34, 36, 38; random logic, stored pattern **2**, 32; register file **2**, 34; regular structure **2**, 34, 36, 37; scheduling and control **2**, 34-35; scheme for random logic, pseudo-exhaustive **2**, 36; scheme for random logic, pseudo-random partial-scan **2**, 36; static random-access memory (SRAM) **2**, 34; tools, CKT **2**, 36; tools, PEST **2**, 36; tools, PS BIST **2**, 36
"Built-In Self-Test for Digital Integrated Circuits" **2**, 30-39
Burn-in testing **2**, 12, 80
Buzzell, R. D. **6**, 15, 17
BX.25 protocol, Issue 3 **3**, 54; BELGACOM network **4**, 64, 67, 70

C

C language **1**, 78: development tool kit **4**, 66; object-oriented language **4**, 5, 73
C++ language **2**, 36; **4**, 7, 9, 73; **6**, 44
C-Classic **1**, 70, 73, 75-80; terminology **1**, 76-79
C5 language **4**, 7
Cable TV (CATV) **5**, 12; **6**, 48, 50, 53
Cabling, fiber-optic metal shields **1**, 2
CAD (Computer-aided design) **1**, 49, 50; **2**, 11, 58, 59, 61, 62; **6**, 63; boundary-scan CAD (BCAD) **2**, 37, 38; -to-test **2**, 61
CAE (Computer-aided engineering) **1**, 54-56
CAE/CAD (Computer-aided engineering–computer-aided design) **2**, 56
CAE/D/M (Computer aided engineering/design/manufacture **1**, 40, 41, 43
Califiore, Robert L. **2**, 56-65
Call Accounting System (CAS) **4**, 86, 89
Call Accounting Transfer **4**, 86
Call competition rate, 5ESS® **6**, 35
Call connection control **6**, 86, 87
Call control **6**, 86, 87
Call forwarding and call rejection **6**, 45
Call Management System (CMS) **4**, 89, 96
Call waiting plus **6**, 45
Calling name display **6**, 44
Campbell, Richard L. **2**, 4-9
Canonical encoding rules (CER) **3**, 80-82, 86-88, 93
Capability index **1**, 55
Capped mesa-buried hetrostructure (CMBH) **2**, 75
Carestia, Paul D. **6**, 93-100
Caretaker key **5**, 33
Carlin Jr., Raymond E. **3**, 46-56
Carnegie Mellon University **5**, 12
Cartography **5**, 75
Carver, Gary E. **2**, 66-76
CCITT **3**, 21; **4**, 10: Blue Book **3**, 21; credit card **3**, 66; messaging standard V. 42 **3**, 19; Red Book **3**, 21; Standard Recommendation G.721 Adaptive differential pulse code modulation (ADPCM) **3**, 29; Standard X. 400 **3**, 5, 21-32, 40-45; Study Group 7 **3**, 21
Caesar cypher **3**, 8
Caesar, Julius **5**, 24
Cell site (CS) **6**, 58
Cell delay jitter **4**, 103, 104; **6**, 86
Cell loss rate (CLR) **4**, 101, 107
Cell relay networks and StarKeeper® II NMS **4**, 46-55
"Cellular and PCS Digital-Mobile-Services Switching Center" **6**, 55-61
Cellular: and 5ESS® switch **6**, 55-61; advanced mobile phone service **6**, 55; and ATM **6**, 52; cell site (CS) **6**, 58; CTIA IS-95 standard (CMDA) **6**, 58; digital packet data (CDPD) **3**, 17, 19, 20; encoding **5**, 22; global system for mobile communication (GMS) **6**, 55, 58; Japan personal digital cellular (PDC) **6**, 55, 58; mobile-station radio (MS) **6**, 58; radio **3**, 19; standards **3**, 17; switching **6**, 6; technology **3**, 17;
Central Access and Display System (CADS) **4**, 70, 71
Central office (CO) **4**, 82, 84
Central processing unit (CPU) **4**, 26, 51, 53
Centralized management information protocol (CMIP) **4**, 90;
Centralized management object transport (CMOT) **4**, 90
Centralized System Management (CSM) **4**, 84, 86, 88
CENTREX **6**, 39, 43-45
Ceramic substrates **6**, 71
Chairman's Quality Award (CQA), AT&T **1**, 17
Chakraborty, Tapan **2**, 19-29
Challenge-response protocols **5**, 12
Chan, H. Anthony **2**, 77-85
Change management **1**, 14
Channeled substrate buried heterostructure (CSHB) **2**, 72
Chao, Chin-Wang **4**, 69-81
checksum techniques **5**, 58
Chemical vapor deposition (CVD) **3**, 98, 100, 101, 103, 104, 106, 107
Chemical-mechanical polishing **3**, 109
Cheng, Kwang-Ting **2**, 19-29
Cheswick, W. **5**, 58
Chosen plaintext attack **5**, 24-26, 28
Ciaccia, Tom J. **1**, 48-58
cimgr **1**, 65-67

Ciphertext **5**, 24-29: characters, digrams, trigrams **5**, 28; ciphertext-only attack **5**, 24, 26, 28, 29; frequency analysis **5**, 28, 29
Circuit know thyself (CKT) **2**, 36-38
Circuit Pack Improvement Team (CPIT), 5ESS® **6**, 65,67
Circuit packs, testing high-density SMT **2**, 56-65
Circuit-switched pulse code modulated (PCM) voice **6**, 60
Circuits: automatic test generation for **2**, 19-29; combinational **2**, 19; sequential **2**, 19-22
Cisco Corporation **5**, 57
Classic **1**, 15: **1**, 69-80
"Classic and PROSE Stories: Enabling Technologies for Knowledge-based Systems" **1**, 69-80
Classic language **1**, 15, 70
Cleartext **5**, 32
CLEP + speech encoding **2**, 3
Client-based isolation **5**, 59
Clinton, President **5**, 11
Clipper Chip **5**, 6, 15; **6**, 2
Cloning, digital signatures **5**, 11
Cluster testing **2**, 41
Code division multiple access (CDMA) **6**, 6, 55, 56, 58-61: CTIA IS-95 standard **6**, 58
Code-excited linear predictor (CELP) **3**, 62
Code inspection **1**, 65
Combinational circuits **2**, 19
Common channel interoffice signaling (CCIS 6) **6**, 40
Common channel signaling (CCS) **6**, 24, 26; and 4ESS™ switch **6**, 94
Common intermediate format (CIF) **4**, 99, 100
Common IP Security Option (CIPSO) **5**, 58
Common Management Information Protocol (CMIP) **3**, 31, 42
Common Management Information Service (CMISE) **6**, 49
Common network interface (CNI) ring, 4ESS™ switch **6**, 94
Communications, and AT&T security **5**, 6
Communications, security of **5**, entire issue
Communications Services Group (CSG) **6**, 54
Compact digital exchange (CDX), 5ESS® **6**, 32
Compact disc (CD) **4**, 98
Compartmented Mode Workstation **5**, 59
Complementary metal-oxide semiconductor (CMOS) **2**, 30, 37; **3**, 16 17, 96, 97, 101: technology **3**, 109
Composite, tag value **3**, 82
CompuServe* **3**, 19
Computer Emergency Response Team (CERT) **5**, 12, 45: /Coordination Center **5**, 56
Computer fraud **5**, 5
Computer security **5**, 40-51
Computer-aided design (CAD) **1**, 49, 50; **2**, 11, 58, 59, 61, 62; **6**, 63; boundary-scan CAD (BCAD) **2**, 37, 38; -to-test **2**, 61
Computer-aided engineering (CAE) **1**, 54-56
Computer-aided engineering/computer-aided design (CAE/CAD) **2**, 56
Computer-aided engineering/design/manufacture (CAE/D/M) **1**, 40, 41, 43
Computer-aided software engineering (CASE) **4**, 22-28
Computer-Watch® Audit-Trail Analysis Tool **5**, 57
Computing, pen-based **3**, 17
Computing, wireless **3**, 17
"Concurrent Engineering: An Enabler for Fast, High-Quality Product Realization" **1**, 34-47
Concurrent engineering **6**, 65-67: and design for X, **1**, 34-40, 43; and product realization **1**, 34-47
Conferencing, multimedia, and ATMs **4**, 97-108; **6**, 81-92
Congestion control **6**, 88
Confidentiality of data **5**, 10, 12-14
Configurators, PROSE **1**, 69-80
Conformance measurement **6**, 15
Conformity of oxide **3**, 97
Congressional hearings, security **5**, 6
Connection control and management **6**, 42, 44
Consecutive self-loops **2**, 25
Constant bit rate (CBR) **4**, 99, 100, 102, 106, 107
Constructor, tag value **3**, 82
Contact-type IC card **5**, 63
Contactless AT&T Smart Card **5**, 61-72
Content addressable memory **2**, 34
Continuity test (CV) **4**, 71-73
Control domain forms, switching **6**, 22
Control fabric interface continuum (CFI), switching **6**, 21, 23, 24
Control knowledge **1**, 69
Control logic **2**, 16
Controllability, in testing digital circuits **2**, 23
Conversant Voice Information System (CVIS), AT&T **3**, 46, 48-50
COPS security package **5**, 56
Copyright infringement **5**, 8
Cordless technology **3**, 17
Corporate Information Office **1**, 15
Corporate Quality Office **1**, 7
Corporate strategy and development **1**, 9, 13
Cost Allocator System (CAS) **4**, 88
Cost-of-ownership model **3**, 104
C/p **1**, 49, 50
C/pk **1**, 49, 50
CPE networks, management of **4**, 82-96
CPE products **6**, 48, 49, 53
CPM-HS interface **4**, 67, 68
Crabill, Edwin F. **6**, 39-47
Crack password security **5**, 56
Craft access terminal (CAT) **4**, 31, 32
Crane III, F. Edward **2**, 10-18, 40-48
Credit cards, privacy of **5**, 3
Credit processes, anonymous **5**, 3
Critical dimension (CD) control **3**, 96
Critical path method (CPM) **1**, 39, 40
Croak, Miriam Rogers **3**, 5-6
Cross-connect, digital (DSX) **4**, 79; (*see also* DACS)
Cross-functional teams (CFT) **1**, 35, 36, 39-42, 48-55
Cryptanalysis **5**, 7: an introduction **5**, 24-29
Cryptographic agents **5**, 31
Cryptographic file system (CFS) **5**, 32-34, 37
Cryptographic hash **5**, 34
Cryptographic protocols **5**, 3
Cryptography **3**, 8-12; **5**, 7, 30-38, 58, 73, 78: for distributed systems **5**, 30-39; public key **5**, 17-23, 79
CryptoLib **5**, 36, 37
Cryptology, **3**, 8-12: asymmetric **3**, 10, 30, 36, 37; conventional **3**, 10; key management **3**, 36; and electronic distribution **5**, 73-80; one-key **3**, 10, 11; private key **3**, 10, 30; public key **3**, 10, 30; symmetric **3**, 10, 30, 36, 37; two-key **3**, 10
Cryptosystems: asymmetrical **5**, 35; conventional **5**, 17, 21, 22; symmetrical **5**, 35
CTIA IS-95 standard (CMDA) **6**, 58
Ctree+ **4**, 66
Cunningham, James P. **4**, 14-21
Current Clinical Trials **5**, 73
Curry, D. A. **5**, 56
Customer: account services (CAS) **3**, 55; assistance requests (CAR) **6**, 67, 68, 69; interface platform of 4ESS™ switch **6**, 94; -initiated access **3**, 47, 48; premises equipment **6**, 48, 49, 53; report card **6**, 15; satisfaction through robust design **1**, 48-58; -supplier partnering **1**, 9, 12, 13, 35; value added (CVA) **6**, 7, 11, 15-17
"Customer-Focused Manufacturing in Switching Systems Business Unit" **6**, 62-70
Cyberspace **5**, 10,11, 14, 15
Cyclical redundancy checks (CRC) **5**, 14
Cymbal™ **4**, 24
Cypher Block Chaining **3**, 36
Cyphers, **3**, 8
Czochralski GaAs **2**, 69

D

D'Angelo, Diana M. **3**, 7-13; **5**, 20
DACS®: -2000, and expert configurators **1**,

DACS® *(continued)*
72-74, 77; DACS II system **4**, 57, 60, 61;
DACS III system **4**, 70, 72, 73, 75-77; DACSCAN®-2000 Controller C-Module **4**, 59, 60, 62, 64, 68; element management system (DEMS) **4**, 78;
Dallas Works **1**, 37, 75
Damascening **3**, 109
Dangler cutover **4**, 79
Database management and intelligent networks (IN) **6**, 44
Data communications and intelligent networks (IN) **6**, 44
Data conferencing, and ATMs **4**, 97-108; **6**, 81-86, 88-91
Data encryption **5**, 31
Data Encryption Standard (DES) **3**, 36; **5**, 18, 31, 34, 36, 58, 65, 66, 69
Data flow representation **4**, 43
Data networking, and ATM **6**, 20, 81-86, 88-91
Data, graphical analysis of **1**, 3
Data, "non-voice" **3**, 20
Data-encrypting key (DEK) **3**, 36
Data-flow diagram **4**, 38-40
Databaseless Security System **5**, 67
Datakit® virtual circuit switch **4**, 30, 32, 67: BELGACOM's **4**, 64
Datashadow **5**, 9
Daudelin, Abraham N. **3**, 46-56
Davidson, Scott **2**, 10-18, 19-29
DDM-2000, and PROSE **1**, 79
Decision-graph interface (DCI) **6**, 44
Dedicated files (DF) **5**, 65
Defects, "stuck-at" **2**, 8, 10, 11, 20, 30
Defects, bridging **2**, 8
Defense Information Systems Agency (DISA) **5**, 44
DEFINITY®PBX **3**, 4-6, 57-65; AUDIX® integrated functionality **3**, 62; AUDIX® voice mail system **3**, 4-6, 57-65; disk/alarm board (ALB) **3**, 58, 60; fault management system **4**, 92, 94, 95; G.2 PBX **3**, 4-6, 46, 48, 49, 51; **4**, 12; G1 and G2 PBXs **3**, 61; G2 and G3 PBXs **4**, 83-87, 89-94, 96; G3 management applications (G3-MA) **3**, 62, 63; **4**, 86, 87, 89, 94; management of **4**, 82-96; multifunction board (MFB) **3**, 58-60, 62; time division multiplexing (TDM), **3**, 57
Delay faults **2**, 28
Delay, data transmission **6**, 86
Deming, Dr. Edward W. **2**, 4
Denver Works **3**, 59
Deposition techniques, ICs **3**, 94-111
Description logic **1**, 70
Design for manufacturing (DFM) **6**, 62, 63, 67
Design for test/testability (DFT) **2**, 7, 8, 16, 19, 24-27, 34, 35, 41, 42, 46, 49-57, 60, 61;
Design for test *(continued)*
standard IEEE 1149.1-1990, **2**, 34, 57
Design for X, **1**, 23, 34, 40, 43: and concurrent engineering **1**, 23, 40, 43, 44
"Designing Operations Systems Interfaces That Are Easy to Use" **4**, 14-21
Destruct test limit **2**, 82
Device Quality Issue (DQI) process **6**, 65
Dialectic film **3**, 98, 100, 104
"Dielectic Materials for Advanced VLSI and ULSI Technologies" **3**, 94-111
Differential interference contrast microscopy **2**, 71, 72
Diffie, Whit **5**, 19, 49
Diffie-Hellman key exchange **5**, 13, 19, 20, 21, 49
Digital cash **5**, 31
Digital color-photo imaging **5**, 69
Digital cross-connects **6**, 51, 52
Digital device test methodologies, trends in **2**, 10-18
Digital electronic circuits, automatic test generation for **2**, 19-29
"Digital FM Audio Broadcasting System Developed" **5**, 2
Digital integrated circuits, BIST **2**, 30-39
Digital interface, 4ESS™ switch **6**, 94
Digital Networking Unit-SONET/SDH (DNU-S) **6**, 32, 36
Digital radio **2**, 49
Digital Services Laboratory **4**, 29, 77, 80
Digital signal processor (DSP): 16A1 **2**, 3; -32C processor **3**, 58, 59; 1605 Enhanced Telephone Answering Device (ETAD) **2**, 3; 16XX processor family **2**, 43; for answering devices **2**, 3
"Digital Signal Processor Optimized for Answering Devices" **2**, 3
Digital Signature Algorithm (DSA) **5**, 13, 36
Digital Signature Standard (DSS) **3**, 12; **5**, 20-22
Digital signatures **3**, 30; **5**, 11, 12, 17-21, 23, 76
Digital speech **5**, 36
Digital Subscriber Signaling One protocol **3**, 66, 80, 81
Digital switching technology, an overview **6**, 4-6
DiMario, Michael J. **6**, 7-18
Dimension® PBX **4**, 82, 83; Maintenance and Administration Panel (MAAP) **4**, 82; procedures (procs) **4**, 82, 83
Direct current (DC) **4**, 22
Direct measure of quality (DMOQ) **1**, 8
Direct memory access (DMA) **3**, 59
Directed graphs, drawing **2**, 3
"Directory-Assistance Preprocessor Using Speech Recognition" **3**, 3
Discretionary access control (DAC) **5**, 47, 57, 59
Distinguished encoding rules (DER) **3**, 80 82, 86-88, 93
Distributed Communications System (DCS) **4**, 83, 85
Distributed computing environment (DCE) **5**, 58
Distributed processing and intelligent networks (IN) **6**, 44
Distributed system interfaces and services, security of **5**, 30-39
Distributed Systems Research Department **5**, 73
"Distributed Switching Architecture Trends and Concepts" **6**, 19-27
Distribution of electronic documents **5**, 73-80
Divide and conquer test strategy **2**, 31
Document distribution, electronic **5**, 73-80
Documentation and training **4**, 14
Documentation facility **3**, 3
Domain knowledge **1**, 69
Donnell, Augustus J. **1**, 17-25
Doped silicon dioxide **3**, 98, 102: BPTEOS, BPSG **3**, 101-103
DORA2 **2**, 59, 62, 63
Downtime, switch system and switching module **6**, 37
Dry-etch patterning **3**, 96
DS3 protection switching, 4ESS™ switch **6**, 97
DSP (*see* Digital signal processor)
Dual-rail optical inputs-outputs **6**, 73, 77
Dual-tone multifrequency (DTMF) **3**, 62; detection, **3**, 62
Dyer III, William W. **2**, 56-65
"Dynamic Graphical Analysis of Network Data" **1**, 3
Dynamic Network Operations **4**, 10
Dynamic random access memory (DRAM) **2**, 37, 38; **3**, 57, 59, 98
Dynamic testing **2**, 83

E

Earthquake protection, 5ESS® **6**, 33
Eastman Kodak Company **5**, 2
EasyLink® Service **3**, 19
Echo cancellers, 4ESS™ switch **6**, 97
"Efficient Encoding Rules for ASN.1-Based Protocols" **3**, 80-93
Eick, S. G. **1**, 3
Eisen, Steven R. **5**, 52-60
Electrically erasable programmable read-only memory (EEPROM) **2**, 61
Electrohome* 3100 **4**, 31
Electromagnetic compatibility, 5ESS® **6**, 34
Electromagnetic interference (EMI) **2**, 80, 81
Electron-cyclotron-resonance microwave discharge film deposition **3**, 96
Electron-cyclotron-resonance chemical-vapor deposition (ECRCVD) **3**, 94, 99, 100

Electronic agents **5**, 10
Electronic code book (ECB) **5**, 66, 67
Electronic commerce **5**, 14, 30
Electronic data interexchange (EDI) **3**, 23-25, 29-31, 42: P/edi or P/35 **3**, 29
Electronic document distribution **5**, 8
"Electronic Document Distribution" **5**, 73-80
Electronic directory **6**, 43
Electronic health ID **5**, 15
Electronic mail **5**, 41
Electronic Mail Association **3**, 42
Electronic mail, message handling system **5**, 42
Electronic Messaging Association **3**, 27
Electronic messaging systems: **3**, entire issue; security in **3**, 7-13
Electronic paper platform (EPP) **4**, 7
Electronic purse **5**, 70
Electronic tax services **5**, 30-39
Electronic transactions, authoritative **5**, 9-16
Electronic transactions, security of **5**, 6, 9
Electronic transistor driver cascade **6**, 73
Electronics Industries Association **5**, 3
Electro-optical testing hardware **2**, 67-69
Electrostatic discharge (ESD) **2**, 72, 75, 80
Element management system (EMS) **4**, 77, 78
ElGamel cryptosystem **5**, 36
"Emerging Technologies and the Messaging Market" **3**, 4-7
"Enabling Technologies for World-Class Business Operations" **1**, 6-16
Enabling technologies: **1**, entire issue; overview **1**, 4-5
Enciphering/deciphering **5**, 24
Encoding: rules for ASN.1-based protocols **3**, 80-93; and electronic distribution **5**, 73-80
Encrypted mode **5**, 66: value **5**, 66
Encryption: and electronic distribution **5**, 73-80; asymmetric **3**, 30; digital signatures **3**, 30; for distributed systems **5**, 30-39; private key **3**, 30; public key **3**, 30; symmetric **3**, 30; technology **5**, 4-8, 58; /decryption **5**, 24; trapdoors **5**, 18
Engineering, furnishing, and installing (EF&I) costs **6**, 29
Engineering Research Center (ERC) **2**, 50, 52, 53
Engineering rules **1**, 73
Engineering specification (SPEC) **1**, 74, 75
Englert, Paul A. **2**, 77-85
Enhanced Telephone Answering Device (ETAD) **2**, 3
"Ensuring Structural Testability of High-Density SMT Circuit Packs" **2**, 56-65
Environmental Protection Agency **4**, 23
Environmental stress screening **2**, 78, 79; **6**, 64
Environmental stress testing (ESS) **2**, 12, 46, 77-85; **6**, 63-65, 67
"Environmental Stress Testing" **2**, 77-85
EO® Personal Communicator **3**, 17, 19
Erasable electronic programmable read-only memory (EEPROM) **5**, 62, 63
Erasable programmable read-only memory (EPROM) **3**, 98
Escrow agents **5**, 33
Escrowed Encryption Standard (EES) **5**, 6, 15, 33; **6**, 2
Ethernet* **3**, 58, 59; **5**, 34; TCP/IP network **4**, 30
European Commission **3**, 22; **4**, 56
European Computer Manufacturers Association (ECMA) **3**, 7
European Information Technology Security Evaluation (EITSE) **3**, 11
European Telecommunications Standards Institute (ETSI) **3**, 19
Evolution Laboratory **4**, 11-12, 29-34
"Evolution of Messaging Standards" **3**, 21-45
Exception reporting **1**, 27
Execution-data collection **4**, 43, 44
Expert Analysis Solution Assistant **4**, 23
Expert configurators **1**, 72, 73; and PROSE **1**, 69-80
Extended switching module-2000, 5ESS® (XSM-2000) **6**, 31, 33
"Extending Design-for-Test Into the Analog and Mixed-Signal Domains" **2**, 49-55

F

Fabric architecture forms, switching **6**, 22, 23
Facial scans **5**, 69
Facilities management **6**, 44
Failure mode analysis (FMA) **2**, 40, 79, 84
Fallah, M. Hosein **1**, 26-33
FASTAR℠ operations system **4**, 11, 69-81
"FASTAR℠ Platform Gives the Network a Competitive Edge" **4**, 69-81
Fault coverage **2**, 10
Fault isolation/diagnostics **2**, 12
Fault tolerance **2**, 12
Faults: "stuck at" **2**, 8, 10, 11, 20, 30; delay **2**, 28
Febo, Michael V. **2**, 56-65
Federal Communications Commission (FCC) **5**, 3; **6**, 29, 67
Federal Reserve **5**, 3
Feedback process **1**, 11, 12
Fenner, Peter **1**, 52, 54
Fiber distributed data interface (FDDI) **4**, 104; **5**, 35
Fiber-based access and transport **6**, 19, 20
Fiber-optics: cable, metal shields **1**, 2; facilities **5**, 5; African undersea network **6**, 2
Field-effect transistor self electro-optic effect device **6**, 76-80
Field oxide **3**, 96
Field-programmable gate array (FPGA) **2**, 11; **6**, 2
File encryption **5**, 36
File Transfer Protocol (FTP) **3**, 35, 40
Filleting **3**, 108
Fine-pitch surface mounting **2**, 47
FIPS PUB 180, 184 **5**, 13
Firewall **5**, 57, 58
"Firewalls and Internet Security" **5**, 58
Firm price quote (FPQ) **1**, 73-75
First-in, first-out **2**, 32, 34, 37, 38
Flat panel displays, electroluminescent **5**, 2
Flip flops **2**, 19, 22, 24, 27, 30, 32-34
Florida Power and Light, and quality improvement story (QIS) **1**, 51
Flowing **3**, 109
Fluorescence spectrum of a molecule **4**, 2
"Focus on Network Reliability: Power and Infrastructure" **4**, 22-28
FOCUS-Prime **1**, 41; **2**, 59, 62, 63
"Forrest Gump" **5**, 15
Foster, James H. **6**, 93-100
Frame-selector to channel-element (FS-CE) protocol **6**, 60
Frame relay (FR) **4**, 46; 6, 48, 54; comparison with other technologies **6**, 89-91
Frame-relay protocol handler, 5ESS® **6**, 59, 60
FrameMaker* **1**, 65, 66; **4**, 39
France, and voice technology **6**, 45
Freephone service (*see* 800 service)
Freespace systems, photonic **6**, 73-80
Frequency (RF) hopping, radio **3**, 15
Frequency analysis: and ciphertext **5**, 28, 29; and ciphertext, characters, digrams, trigrams **5**, 28
Frequency-division multiple access (FDMA) **6**, 58, 59
Frequency modulation (FM) **4**, 98; digital audio broadcasting system **5**, 3
Frequency planning **6**, 59
FT Series G **4**, 70, 72
ftp **5**, 53, 57, 58
FTS-2000 messaging network **3**, 22
Full scan testing **2**, 25
Function points **4**, 27
Functional task team (FTT) **1**, 52, 54, 55
Fuoco, Gene **4**, 69-81

G

G2 language **4**, 73
Gale, B. T. **6**, 15, 17
Gallium arsenide (GaAs) **2**, 30; **3**, 94; **6**, 77
Ganser, E. R. **2**, 3
Gap filling **3**, 109
Gate arrays **2**, 11
Gate spacing **3**, 108
Gate-oxide shorts **2**, 28
Gatenby, David A. **1**, 34-47, 48-58

Gelman, Stacey **4**, 35-45
General Data Model for Objects (GDMO) **3**, 31
General Magic **3**, 43
General Rommel **5**, 5
General telemetry processor (GTP) **4**, 70
Generic Data Model for Objects (GDMO) **3**, 31
GenRad* GR9000 test set **2**, 52
GENTEST test generator **2**, 7, 8, 19, 21-24
German air raids **5**, 4
German codes **5**, 4, 5
Germanium **3**, 94
Glass-BOX testing, and PTT Telecom **6**, 36
Global Business Communications System (GBCS) **4**, 7, 85-96: Technical Service Center **4**, 7, 88
Global Configurator, 5ESS® **6**, 34
Global Engineering and Control Center **6**, 69
Global Information Solutions (GIS, formerly NCR) **2**, 45; **3**, 15, 19; **4**, 7, 96; **5**, 43
Global Information Solutions StarSENTRY™ **4**, 64, 66, 92
Global Protection Against Limited Strike (GPALS) system **5**, 40
Global system for mobile communication (GMS) **6**, 55, 58
GlobeView™-2000 Broadband System **6**, 4, 26, 49, 52-54
Goal state **1**, 74
Government OSI Profile (GOSIP) **3**, 22
Graphical analysis, dynamic **1**, 3
Graphical user interface (GUI): **2**, 35; **4**, 11, 42, 53, 60, 62, 65, 68; design of **4**, 14-21
Graphics, and ATM **6**, 20
Graphs, drawing directed **2**, 3
Gray, Mary L. **2**, 66-76
Greismer, Stephen J. **3**, 11, 21-45
Gretag Data Systems **5**, 11

H

Hall, Jr., Harry M. **6**, 71-80
Hand geometry **5**, 69
Hard masking **3**, 107
Hardened remote integrated-services line unit (HRISLU), 5ESS® **6**, 33;
Hardware accelerators **2**, 16
Health ID, electronic **5**, 15
Heath, III, Sidney F. **6**, 62-70
Hebrew atbash cypher **3**, 8
Heffler, M. J. **3**, 3
Hellman, Martin **5**, 19, 49
Heuristic design **4**, 16
Hewlett Packard **4**, 30, 66, 73: 9000 Series 700 workstation **4**, 51, 53, 66; 9000 Series 720 CRX workstation **4**, 66; 9000 Series 857S, 870S-100, 870 **4**, 68; OpenView* **4**, 92; printers **4**, 67, 68; Testjet* **2**, 58; 9480
Hewlett Packard *(continued)*
test set **2**, 51; UX operating system **4**, 66, 68; VUE* **4**, 19
High- and low-mobility PCS network architecture **6**, 55
High definition TV (HDTV) **6**, 85
Hinterlong, Stephen J. **6**, 71-80
Hobbitt chip, AT&T 92010 **3**, 16
Hobbs, Greg **2**, 82
Holland, Hans G. **6**, 28-38
Hotline, Washington-Moscow **5**, 18
Hough, Robert M. **1**, 17-25
Houghton, Thomas F. **1**, 59-68
Howard, Randall E. **1**, 34-47
Hsu, Jay C. **1**, 6-16
Hsueh, T. Richard **1**, 59-68
Huang, C. P. **6**, 28-38
Huensch, George D. **6**, 19-27
Hughes, Greg **1**, 54
Human-computer interfaces, designing **4**, 14-21
Hurricane Andrew **4**, 23
Hushyar, Kaveh **1**, 34-47
Hyde Park, N.Y. **5**, 17
Hypertext **5**, 78

I

$I/_{DDQ}$ testing **2**, 28
IBM **2**, 77; **4**, 90: Baldrige winner **1**, 49
IC-level computer-assisted (ICCAT) design for testability (ATTDFT) **2**, 19, 35-37, 54, 61-63
ICCAT/ATTDFT **2**, 35-37
Identity: authentication of **5**, 32; authenticity of **5**, 10-12
Identity-based cryptosystems **5**, 20, 22
IEEE **1**, 29; **5**, 80: boundary-scan standard **2**, 7; messaging standard 802.11 **3**, 19; standard 1149.1 **2**, 13, 16, 37, 38, 40, 41-43, 47, 60; standard 1149.1-1990 **2**, 34, 57, 60; standard P1149.4 **2**, 51, 54
III-V semiconductors **2**, 30, 66, 69, 70, 72, 75; **3**, 94; organic **5**, 2
Improvement paradigm **1**, 12-13
Image compression **5**, 69
Imaging: automatic scene-change detection **2**, 2; digital color-photo **5**, 69
Implication, in testing **2**, 20
Improvement paradigm **1**, 12-13
In-circuit tester **2**, 40
In-circuit testing (ICT) **2**, 40, 41, 56, 59, 60, 61-63
In-process testing **2**, 26, 27
Indigo* R4000 Workstation **3**, 3
Industrial espionage **5**, 5, 6
Industrial, scientific, medical band (ISM) **3**, 15
Infant mortality **2**, 78, 81
Information age, trust in **5**, 9-16
Information Superhighway **5**, 5, 7, 9
Information Vending Encryption System (IVES) **5**, 12
Information-object class **3**, 71-74, 77, 78
INFORMIX: ACE reporter generator **4**, 51, 62; Relational Database **4**, 51, 53, 67, 68, 88; Software Inc. **4**, 51; structured query language (SQL) **4**, 51, 53
INFOSEC **5**, 44
Infrared (IR) technology **3**, 14
Injected product defects **6**, 14
Injection point, RNC **4**, 73
Inmarsat satellite **3**, 15
Institute of Electrical and Electronic Engineers (*see* IEEE)
Insulating films **3**, 95
Integrated circuits (IC): **2**, 11, 16, 19; **3**, 59, 94-111; built-in self-test for **2**, 30-39
Integrated circuit card industry **5**, 62
Integrated project management (IPM) **1**, 34, 35
Integrated services digital network (ISDN) **2**, 49, 53, 54, 64; **3**, 49, 66, 77, 80, 81; **4**, 5, 32, 83, 85, 92; **5**, 36; **6**, 19, 23, 24, 26, 28, 43, 55-57, 61: and 5ESS® switch architecture **6**, 25, 26, 30-33, 36; basic rate interface (BRI) **6**, 56, 57
Integrated services line unit (ISLU), 5ESS® **6**, 25, 33
Integrated testing **2**, 5
Integrity of data **5**,10, 14
Intel: 486* **2**, 2; Telephone API **3**, 43
Intelligent network (IN) **6**, 28: architecture **4**, 5; **6**, 19, 41-43; elements **6**, 41; functions **6**, 41; service processing systems for AT&T's **6**, 39-47; services **6**, 41, 44-46; technologies **6**, 44, 45
Intelligent peripherals (IP) in INs, **6**, 41, 42
Inter-LATA services **4**, 7
Interactive Development Environments, Inc. **4**, 24
Interactive Multimedia Association (IMA) **4**, 97
Interactive TV **5**, 30-39
Interactive voice response (IVR) **6**, 45
Interexchange carriers (IEC) **4**, 7
Interexchange key (IK) **3**, 36
Interfaces, design of operations systems **4**, 14-21
Interference contrast microscopy **2**, 71
Intermetal dielectric (IMD) **3**, 97, 98
Internal contrast microscopy **2**, 71
Internal quality audit (IQA) **1**, 19
Internal scan **2**, 16
International Federation for Information Processing Task Group 6.5 **3**, 42
International Organization for Standardization (ISO): **1**, 32; **3**, 7, 21, 22, 31, 32, 41, 67, 81;

ISO *(continued)*
5, 62, 63; **6**, 33, 34; 3166; **3**, 33; 8859-1 character set **4**, 66; 9000 standard **1**, 6, 17-22, 26, 28, 29, 33; **6**, 7, 9, 12, 68; 9001 standard **1**, 17-21, 32; 9002 standard **1**, 18; 9003 standard **1**, 18; and Baldrige Award **1**, 19; International Electrotechnical Commission (IEC) **3**, 42, 67; and Merrimack Valley **1**, 17-25; messaging standard 10021, parts 1-7 **3**, 21; and process improvement (APEX) in the Transmission Systems Business Unit **1**, 17-25; Processing Task Group 6.5 **3**, 42; Subcommittee 18 **3**, 21; 9000 standard **1**, 6, 14 17-25, 26, 28;
International Telecommunications Union (ITU) Recommendations **3**, 21, 25, 41, 31, 32, 55; **4**, 10; Telecommunications Standardization Sector (ITU-T) **3**, 42, 67, 81; ITU-T architecture **4**, 10, 57, 67; ITU-T definition of intelligent networks **6**, 41
International Telegraph and Telephone Consultative Committee (*see* CCITT)
Internet: **4**, 90: **3**, 62, 63 Activities Board **3**, 21, 35; Domain Name Service **3**, 34; Engineering Task Force (IETF) **3**, 32, 42; File Transfer Protocol (FTP) **3**, 35, 40; firewalls and security **5**, 58; message security section **3**, 30; messaging standard RFC 822 **3**, 21, 32-45; network **5**, 15, 19, 30, 44, 49, 53, 54, 56; Post Office Protocol (RFC) 1225 **3**, 32; privacy enhanced mail **3**, 30; protocol **4**, 71, 76; protocol (IP) datagrams **5**, 34; protocol (IP) packet layer **5**, 57; protocol (IP) packets **5**, 49; protocol (IP), swIPe **5**, 34, 35; request for comments (RFC) 1225 **3**, 32; and RFC 1422 **3**, 37; and RFC 1423 **3**, 36, 37; Society **3**, 21, 41; Trivial File Transfer Protocol (FTP) **3**, 40; and X.400 standards, body part support **3**, 40-43; and X.400 standards, compared **3**, 40-43
Interpersonal message protocol (P2) **3**, 28
InterSpan services **6**, 54
Intuity™ AUDIX® **3**, 57, 61
Ion-implant screening **3**, 108; source/drain **3**, 96
Irving, Nancy B. **4**, 28
IS-54-B authentication system **5**, 22
ISO (*see* International Organization for Standardization)
"Issues and Mechanisms for Trustworthy Systems: Creating Transparent Mistrust" **5**, 30-39
Iterative deepening **1**, 74
Iterative prototyping and redesign **4**, 16
ITU Telecommunications Network Management **3**, 31, 42
Iwama, Morimi **6**, 4-6

J

JAM **4**, 24
Japan personal digital cellular (PDC) **6**, 55, 58; Personal Handy Phone System (PHS) **6**, 55, 56, 58
Japanese codes **5**, 4
Jarwala, Najmi T. **2**, 40-48
Jeschke, Charles E. **6**, 28-38
Jesmajian, Richard W. **3**, 11, 21-45
Jitter, cell delay **4**, 103, 104; **6**, 86
Joint Photographic Experts Group (JPEG) **3**, 30
Joint Pictures Expert Group (JPEG) **4**, 97
Jones, Capers **4**, 27, 28
"Journal On Selected Areas in Communications" **5**, 80
Jrad, Ahmed M. **1**, 26-33
Julius Caesar **5**, 24
Jump Start **1**, 62
Just-in-time testing **2**, 26, 27
Just-in-time, and Total Quality Control (TQC/JIT) **6**, 68
Justification, in testing **2**, 20
JYACC, Inc. **4**, 24

K

Kalrez* **3**, 107
Kane, Jack **2**, 10-18
Kaplan, Michael M. **5**, 4-8
Katkar, Vanita **6**, 81-92
KDD **6**, 53
Kent Jr., Richard J. **1**, 6-16
Kerberos authentication service **5**, 35, 58
Key: certificate authority (KCA) **5**, 13; certificates **5**, 35; certification system (KCS) **5**, 13, 14; cryptographic **5**, 58; distribution center (KDC) **3**, 11; encryption **5**, 48: management **5**, 12, 14, 17-19, 23, 30, 32-35, 38; management center **5**, 7; -seeded MD5 cryptographic algorithm **5**, 34, 36; work products **4**, 38;
Keynote Black Pages **5**, 35
Keynote services **5**, 35-37
Kleppinger, W. E. **5**, 40-51, 52-60
KL-ONE knowledge language **1**, 76, 78
Knowledge domain **1**, 69
Knowledge domain database **1**, 69
Knowledge language, KL-ONE **1**, 76, 78
Knowledge, control **1**, 69
Knowledge-based systems: with PROSE and Classic **1**, 59-68; technologies for **1**, 69-80
Known plaintext attack **5**, 24-27, 28, 29
Korduplesk, R. E. **6**, 15, 17
Kropfl, Diane **4**, 69-81
K-Sigma **1**, 56
Kukla, James A. **6**, 39-47
Kulzer, John J. **6**, 19-27
Kuthyar, Ashok K. **6**, 81-92
KY-9 encryption system **5**, 6

L

Lacy, Jack **5**, 30-39
LANs (*see* Local area networks)
LaPadula, and Bell model **5**, 57, 59
Laser, quantum cascade **3**, 2
Latches **2**, 19-22
Latex **5**, 78
Layendecker, Rich **1**, 34-47
LEAF message **6**, 2
Leaky bucket algorithm **4**, 72
Leased lines management system (LLM-SF) **4**, 57
Leased lines management system-fixed (LLM-F) **4**, 59, 62
Lee, Paul M. **1**, 34-47
Legacy systems **1**, 75
Level of adversary effort (LAE) **5**, 43, 45, 46
Levkoff, Jerome **2**, 66-76
"Light Emitted From a Molecule" **4**, 2
Light-emitting diodes (LEDs) **5**, 2
Light weight encoding rules (LWER) **3**, 80-82, 92, 93
Lightly doped drain (LDD) **3**, 96, 97
Lin, Chih-Jen **2**, 30-39
Line terminating equipment (LTE) **4**, 70, 72, 75-78
Line-space encoding **5**, 76-78
Linear feedback shift register **2**, 32
Lip synchronization errors **4**, 101
Liquid-crystal displays (LCDs) **5**, 2
Liquid dispense technique **3**, 99
Liquid-phase epitaxy **2**, 72
Liss Jr., William J. **4**, 46-55
Load test **4**, 76
Load-lock chamber **3**, 103, 105
Local area network (LAN) **4**, 11, 46, 84, 85, 89-91, 93, 97, 104; **5**, 4, 52, 53, 54; **6**, 48, 50; **6**, 88: infrared (IR) **3**, 14, 16, 18, 19; wireless **3**, 14, 16, 18, 19 (*see also* StarLAN®, WaveLAN®, and Ethernet*)
Local exchange (LEC) card, **3**, 50, 55; **4**, 7, 10, 30, 82
Local exchanges, and 5ESS® cellular **6**, 55-61
Local oxidation of Si (LOCOS) **3**, 100
Logic rules document **1**, 79
London, Thomas **5**, 30-39
Lopresti, Philip V. **2**, 49-55
Lotus Corporation **5**, 22
Low delay code excited linear predictive (LD-CLEP) coding **4**, 98
Low Earth orbit (LEO) satellites **3**, 16
Low- and high-mobility PCS network architecture **6**, 55

Low pressure chemical vapor deposition (LPCVD) **3**, 96, 99, 100, 102-107, 110
Low pressure thermal deposition **3**, 94
Lumped transmission line **6**, 74

M

M/D/1 queuing **4**, 105
Maamari, Fadi **2**, 19-29
Macintosh* **4**, 19
Mac Namara, John J. **6**, 55-61
MACLOG generator **2**, 37
Macstar® operations system **4**, 5
Magic Cap* operating system **3**, 18
Maher, David P. **5**, 9-16
Mail **5**, 57
Mail, DEFINITY® AUDIX® system **3**, 4-6, 57-65
Majette, David **5**, 40-51
Malcolm Baldrige National Quality Award **1**, 6-8, 13, 17-19, 49; **6**, 7, 9, 12: and ISO 9000 **1**, 19
Management information base (MIB) **3**, 31; **4**, 90
Management information systems (MIS) **4**, 88, 89-91
Mandatory access control (MAC) **5**, 47, 50, 57
Manufacturing analysis **3**, 104
Manufacturing processes **2**, 5
Manufacturing, 5ESS® switch **6**, 6; **6**, 62-70
Manufacturing/test data management systems **2**, 56
Maranzano, Joseph F. **1**, 59-68
Marathon run **3**, 104
Marinelli, David J. **3**, 57-65
Marking, and electronic documents **5**, 75, 76
Mask levels **3**, 94
Mask-programmable gate arrays **2**, 11
Masks **3**, 94
Massachusetts Institute of Technology (MIT) **5**, 20
Master file (MF) **5**, 65
Maxemchuk, Nicholas F. **4**, 3; **5**, 73-80
MCI Mail* **3**, 19
McNair, Bruce **3**, 7-13
Mean opinion score (MOS) **4**, 98-101, 105-107
Media bridging **6**, 88
Memory: BIST content addressable (CAM) **2**, 31; BIST static random-access (SRAM) **2**, 34; direct memory access (DMA) **3**, 59; dynamic random access memory (DRAM) **2**, 37, 38; **3**, 57, 59, 98; electrically erasable programmable read-only memory (EEPROM) **2**, 61; electronic programmable random access memory **5**, 62, 63; erasable programmable read-only memory (EPROM) **3**, 98; fault- and defect-tolerant RAM **2**, 12: random-access memory (RAM)
Memory *(continued)* **2**, 12, 14, 23, 32, 37; **3**, 59; **5**, 62, 63; read-only memory **5**, 62, 63; static random-access memory **2**, 34; **3**, 98
Merkle, Ralph **5**, 19
Merrimack Valley Works: Data Center **1**, 74; and ISO 9000 **1**, 17-25
Message authentication code (MAC) **5**, 14, 66
Message delivery **3**, 50
Message detail reporting **6**, 44
Message digest (MD5) cryptographic algorithm **5**, 34, 36
Message handling services (MHS): **3**, 6, 66; OSI standard **3**, 71
Message handling system, e-mail **5**, 42
Message Handling Systems (MHS) **3**, 21, 23
Message integrity check (MIC) **3**, 36, 37
Message Oriented Text Interchange System (MOTIS) **3**, 21, 43
Message servers **3**, 48
Message Service, AT&T **3**, 4, 6, 46-56
Message setup **3**, 50
Message store access protocol (P7) **3**, 28
Message transfer access protocol (P3) **3**, 28
Message Transfer System (P1) **3**, 27, 41
Messaging devices **3**, 16, 17
Messaging market, and emerging technologies **3**, 4-7
Messaging services, wireless **3**, 17-19
Messaging standards: CCITT V.42 **3**, 19; CCITT X.400 **3**, 5, 21-32, 40-45; evolution of **3**, 21-45; IEEE 802.11 **3**, 19; ISO 10021, parts 1-7 **3**, 21; Paperless **5**, 4; RFC 822 **3**, 21, 32-45
Messaging, AT&T True **3**, 46
Messaging, DEFINITY® and AUDIX® voice mail **3**, 4-6, 57-65
Messaging: authentication **3**, 10; devices **3**, 16, 17; market, and emerging technologies **3**, 4-7; security in **3**, 7-13; technologies of the messaging market **3**, 4-7; wireless **3**, 14-20
Metal-organic chemical-vapor deposition (MOCVD) **3**, 104
Metal-oxide semiconductor (MOS) **2**, 69, 72; **3**, 97
Metal-semiconductor field-effect transistor (MESFET) **2**, 67, 69, 70
Metrics, process **1**, 11, 17
Meyers, Michael N. **6**, 93-100
MHS Alliance **3**, 43
Microelectronics **2**, 3, 37; **3**, 109
Microminiaturization **2**, 47
Microresearch Corporation **4**, 59, 62
Microscopy: differential interference contrast **2**, 71, 72; interference contrast **2**, 71; internal contrast **2**, 71; transmission electron **2**, 69, 74
Microsoft Corporation **4**, 86: **5**, 22, 47, 53; Excel* **4**, 19; Telephone API **3**, 43; Windows* **4**, 19; Windows* NT* **5**, 47, 53
Microwave: energy **3**, 104; facilities **5**, 5; plasma **3**, 105
Middleware **4**, 9
Migration success, systematic approach **1**, 59-64
Miller, Blair W. **2**, 66-76
Miller, E. O. **1**, 3
Mitchell, J. C. **3**, 3
Mitra, Nilotpal **3**, 66-79, 80-93
Mixed-signal testing **2**, 11, 14, 49-55
Mixed-signal VLSI **2**, 50
Mixed-signal design-for-test **2**, 49-55; testing standard IEEE P1149.4 **2**, 51, 54
MLS/TCP program **5**, 58
MLS/Xwin **5**, 59
Mobile-station radio (MS), cellular **6**, 58
MOBITEX: asynchronous communications (MASC) **3**, 17; radio interface (RIP) **3**, 17, 19
Modem **5**, 52: chip, AT&T V32MX **3**, 16, 17; wireless, elements of, **3**, 17
Modification request (MR) **1**, 28; **4**, 42-44
Moerkerken, Harry **6**, 19-27
Molecule, light emitted from **4**, 2
Monitor I **4**, 86-89
Moore IV, Harry H. **1**, 69-80
MOSAIC: Interface **5**, 73, 78; software integration process, **1**, 59, 64, 67
Moscow-Washington hotline **5**, 18
Motion compensator chip **2**, 37, 38
Motion Picture Experts Group (MPEG) **3**, 30; **4**, 97, 100-102; **6**, 51, 52
Motorola Corporation **4**, 66, 73: and Baldrige Award **1**, 49; and capability index **1**, 55; and Six-Sigma Quality **1**, 49, 51, 52
Muise, Richard W. **1**, 48-58
Multi-chip module (MCM) **2**, 14, 31, 40, 43, 46
Multimedia Communications Forum (MMCF) **4**, 97
Multimedia conferencing: and 4ESS™ switch **6**, 98; and 5ESS® switch **6**, 32; **6**, 20; applications **6**, 6; and ATMs **4**, 97-108; **6**, 81 92; collaboration (MMC) **6**, 82, 83, 88, 89; information services (MIS) **6**, 82-86; mail (MMM) **6**, 82, 84-86; services **4**, 5; teleconferencing, security of **5**, 6, 9; video on demand (VOD) **6**, 82, 84-86; workstations (WSs) **4**, 97, 104
Multipurpose Internet Mail Extensions (MIME) **3**, 37-40, 42; content subtypes **3**, 39; content types **3**, 38
Murray, Richard S. **5**, 61-72

N

N x 64 kbits/s compressed video **4**, 97; switching in 5ESS® **6**, 32
"Nail up" switching **6**, 32
National Computer Security Center (NCSC) **3**, 12 ; Orange Book **3**, 12
National Institute of Standards and Technology (NIST) **3**, 12; **5**, 13, 21, 36
National Radio Systems Committee **5**, 3
NCR (*see* Global Information Solutions)
NCR 3335 (486SX-MCA) system **4**, 66
NetMinder **4**, 62, 65, 67
Netherlands, and Pan-European Network **6**, 52-53
NetView 6000* **4**, 92
NetWare* **5**, 52
NetWatch™ Trusted Security Gateway **5**, 58
Network access, using AT&T's Smart Card **5**, 61-72
Network Audit Analysis System (NAAS) **5**, 57
Network clock, 4ESS™ switch **6**, 94
"Network Constraints in Multimedia Conferencing and the Role of ATM Networks" **4**, 97-108
Network element: defined **6**, 20; domains (control, fabric, interface) **6**, 20-23
Network management and StarKeeper® II NMS **4**, 46-55
Network Management Station (NMS) **4**, 89, 90-94: StarKeeper® II **4**, 46-55
Network mediation unit (NMU) **4**, 57, 60, 62, 64, 66
Network node, defined **6**, 20
Network Operations Center (NOC) **4**, 7, 30
Network reliability, power and infrastructure **4**, 22-28
Network restoration, FASTAR℠ **4**, 69-81
"Network Security in a Heterogeneous Environment" **5**, 52-60
Network Services Complex, 4ESS™ switch **6**, 98
Network Services Division (NSD) **4**, 11, 22-28, 74, 88: Operations Center **4**, 25
Network Services Group (NSG) **6**, 49, 52, 54
Network Status Display **4**, 88
Network Systems **4**, 10, 29, 96: **6**, 20, 33, 34
Network Systems Belgium **4**, 10, 56
Network Systems Group **6**, 4, 6
Network Systems, and PROSE and Classic **1**, 69-80
Network trusted computing base (NTCB) **5**, 48
Networks, CPE, management of **4**, 82-96
Neumann, Peter **5**, 44, 45
New product introduction (NPI) **1**, 17, 21-24
New York Times Times Fax **5**, 73
Ng, Ken K. **1**, 48-58
nmake **1**, 65, 66
Noise-placement encoding **5**, 78
Nokia Corporation **4**, 60, 64
"Non-Destructive Optical Techniques for Characterizing Semiconductor Materials and Devices" **2**, 66-76
"Non-voice" data **3**, 20
"Nonconducting Shield Protects Optical Cable from Lightning" **1**, 2
Nonportable assembly language **5**, 35
Normandy invasion **5**, 4
North African campaign **5**, 5
North American numbering plan (NANP) **3**, 48
Northern Business Information **6**, 70
North, S. C. **2**, 3
Novell Inc. **4**, 85; **5**, 52

O

Office Data Administration System (ODMS), 4ESS™ switch **6**, 96, 97
Object Management Group **3**, 43
Object oriented design (OOD) **4**, 26
Object oriented programming (OOP) **2**, 16, 17
Observability, in testing **2**, 15
Odlyzko, Andrew M. **5**, 11, 13, 17-23,
Off-line testing **2**, 13
Oien, Michael A. **2**, 77-85
Oklahoma City Works **6**, 36, 67-69
"On-Line Documentation Facility" **3**, 3
On-line testing **2**, 13
One-time pad **5**, 18
OneOS Change Program **4**, 7, 8
OneVision™ Network Management Solutions **4**, 82, 92, 95
Open network architecture (ONA) **6**, 44
Open Software Foundation **5**, 58: /Motif* **4**, 66
Open Systems Interconnect (OSI) **3**, 6, 16, 17, 66, 78, 80, 81; MHS standard **3**, 71; Reference Model **3**, 21-23; TC standard **3**, 71, 77
OpenView* **4**, 92
Operational profile **4**, 74, 75
Operational test limit **2**, 82
Operations engineering **1**, 40
Operations improvement **1**, 9, 12, 13
Operations support system interface (OSSI) **4**, 90
Operations systems **4**, entire issue; and 4ESS™ switch **6**, 93, 99
Operations Systems Business Unit (OSBU) **4**, 4-10, 20, 29, 35: Display Construction Set **4**, 10; Major Account Centers **4**, 6
"Operations System Evolution Laboratory" **4**, 11-12, 29-34
Operations systems interface design **4**, 14-21
"Operations Systems: A Perspectives" **4**, 4-13
Operations Technology Center **4**, 23, 24, 74
Operations, administration, and maintenance (OAM&P) **1**, 75; **4**, 9; **6**, 5; and 4ESS™ **6**, 93; and 5ESS® **6**, 28, 30, 31, 32, 42, 43, 48, 51
Operator assistance, using speech recognition **3**, 3
Operator services position system (OSPS) **6**, 30, 43
Operators, automated **6**, 45
Optical beam-induced reflectance (OBIR) **2**, 66, 68, 69, 72-75
Optical cable, nonconducting shield **1**, 2
Optical inputs-outputs, dual-rail **6**, 73, 77
"Optical techniques, non-destructive, for characterizing semiconductor materials and services" **2**, 66-76
Optimal password system **5**, 56
Oracle **4**, 67, 68
Optimized reconfigurable cell array (ORCA) **6**, 2
Orthogonal array testing (OATS) **4**, 24-26
OSI, Government Profile (GOSIP) **3**, 22
Output data compactor (ODC) **2**, 31-34, 38
Output evaluators **2**, 15
"Overview of Enabling Technologies" **1**, 4-5
Oxides, conformity of **3**, 97; doped and undoped **3**, 97, 99

P

P-type/intrinsic/n-type (PIN detector) **2**, 67, 70, 72, 74
P/35 electronic data interchange **3**, 29
P/edi electronic data interchange **3**, 29
P1 message transfer system **3**, 27, 41
P2 interpersonal message protocol **3**, 28
P3 message transfer access protocol **3**, 28
Packed encoding rules (PER) **3**, 80-82, 88-91
Packet filters **5**, 57, 58
Packet Internal Network (PINet) **4**, 70-72, 75, 76, 78
Packet pipe **6**, 60
Packet switch unit 2 (PSU2) **6**, 59-61
Paperless messaging **5**, 4
Paperless office, security of **5**, 6, 9
Paradyne, AT&T **1**, 45
Parallel connections, circuit board **6**, 72
Parket, Don **5**, 45
Partial scan testing **2**, 19, 20, 24-27
Pascal **1**, 78
Passive radio **3**, 15
Passive testing **2**, 83
Pasternack, Gerald P. **1**, 59-68
"Patent to Build On":
"Dynamic Graphical Analysis of Network Data" **1**, 3
"On-Line Documentation Facility" **3**, 3
"Signal Sequence Editing Method and Apparatus with Automatic Timefitting of

"Patent to Build On" (continued)
Edited Segments" **4**, 3
"Technique for Drawing Directed Graphs" **2**, 3
Pay-per-view TV **4**, 5: **5**, 12
PBXs **6**, 50: and caller ID **6**, 39; management of **4**, 82-96: (*see also* DEFINITY®, Dimension®, System 75 and 85)
Pan-European Network **6**, 52-53
Pearl Harbor **5**, 4
Pen-based computing **3**, 17
Pentagon **5**, 6
Perceptual Audio Coding (PAC) **5**, 3
Performance breakthrough **6**, 8, 9
Perganda, Robert A. **6**, 28-38
Persian Gulf war **5**, 6
Personae (electronic agents) **5**, 10
Personal communications network (PCN) **3**, 16, 18
Personal communications services (PCS) **3**, 14-20; **6**, 6, 19, 39, 41, 45; and 5ESS® switch **6**, 55-61; architecture (low- and high-mobility network) **6**, 55; and cellular **6**, 55-61
Personal communications services switching center (PCSC) **6**, 57
Personal Computer Memory Card Interface Association (PCMCIA) **3**, 16, 17, 19
Personal Handy Phone System (PHS), Japan **6**, 55, 56, 58
Personal identification number (PIN) **5**, 47, 61, 65-67, 69
Personal number calling **6**, 45
Personal number portability service **6**, 39
PEST **2**, 36, 37
Phatak, Sunil B. **2**, 66-76
Photo CVD **3**, 104
Photo resist **3**, 94
Photolithography **3**, 96
Photoluminescence (PL) **2**, 67, 69, 71
Photonic chips **5**, 2: dual-rail optical inputs-outputs **6**, 73, 77; and freespace systems **6**, 73-80; and transistor cascade **6**, 73
Photonic switching **6**, 6
Phonics and broadband switching **6**, 71-80
Physical vapor deposition (PVD) **3**, 96
Pingel, Thomas C. **6**, 7-18
Plain old telephone service (POTS) **6**, 40
Plaintext **5**, 14, 24-29, 77
Plasma-enhanced, chemical-vapor deposition (PECVD) **3**, 94, 96-100, 102, 103, 105-107, 110
Plesiochronous digital hierarchy (PDH) **4**, 57
Policy deployment **6**, 10
Polyimides **3**, 103, 104
Poly-buffered local oxidation (PBL) **3**, 100
Polyimide spin cast **3**, 96, 110
Post Office Protocol (POP) **3**, 32: RFC 1463 **3**, 36
Power: conversion and surface-mount transformers (SMT) for **1**, 3; and building systems **4**, 22-28
Power Macintosh* **2**, 2
Power Quality Resource System (PQRS) **4**, 11, 22-28
President Clinton **5**, 11
President Roosevelt **5**, 17
Prevention-based management **6**, 8
"Primary Colors Emitted from Organic Material" **5**, 2
Primitive, tag value **3**, 82
Prince Charles **5**, 5
Princess Diana **5**, 5
Privacy Enhanced Mail (PEM), Internet **3**, 30, 36, 42: RFCs 1421-1424 **3**, 36, 37
Privacy, credit card **5**, 3
Privacy, right-to- **5**, 5
Private cryptographic keys **5**, 31, 49
"Process Control (ISO 9000) and Process Improvement (APEX) in the Transmission Systems Business Unit" **1**, 17-25
Process: definition and improvement, Silver Bullet **4**, 35-45; engineering **1**, 13; **4**, 7; engineering, Silver Bullet **4**, 35-45; feedback, **1**, 11, 12; -hazard review **3**, 104; improvement **1**, 9, 11, 12, 17-25; -iteration model **4**, 36, 38, 42-44; load **4**, 40; management **1**, 9, 13; management teams **4**, 74; **6**, 9, 11-13, 67; manufacturing **2**, 5; metrics **1**, 11; orientation **6**, 8; owners **1**, 11; Process Quality Management Improvement (PQMI) **6**, 11; product **4**, 35; representation **4**, 38, 39, 42
Processes, common and shared **6**, 11
Processor, AT&T DSP-32C **3**, 58, 59
"Producing Software: From Art/Craft to Engineering" **1**, 59-68
Product development and Silver Bullet **4**, 35-45
Product Offerings Expertise (PROSE) **1**, 59-68
Product quality assessment (PQA) **6**, 7, 11, 12, 14, 15, 17
Product realization process (PRP) **1**, 34-40, 42; **2**, 5, 40, 46, 47, 59; **4**, 19: and concurrent engineering **1**, 34-47
Product management **1**, 13, 14; product synchronization problem **1**, 72
Programmer's Interface (PI) **4**, 52, 54
Project orientation **6**, 8
Project plan **4**, 41
Project Silver Bullet **4**, 7, 12, 35-45
Project X encryption system **5**, 6
Project-management model **4**, 40-42, 44
Property management interface translator **6**, 44
PROSE and Classic, enabling technologies for
PROSE *(continued)*
knowledge-based systems **1**, 59-68
"PROSE Knowledge Engineering Guidelines" **1**, 79
Protection channel (T3P) **4**, 77
"Protocol Failure in the 'Clipper' Chip" **6**, 2
Protocol handler for ATM (PHA) **6**, 59-61; for voice (PHV) **6**, 59, 60
Protection switch lockout **4**, 71, 72
Protocol type select (PTS) **5**, 63
Prototyping, security analysis **5**, 41
Pseudo-exhaustive BIST **2**, 36-38
Pseudo-primary inputs **2**, 20
Pseudo-primary outputs **2**, 20
PTT Telecom **6**, 36
Public key algorithms **5**, 36, 49
"Public Key Cryptography" **5**, 17-23
Public Key Partners **5**, 22
Public switched telephone network (PSTN) **6**, 57, 60
Pulse coded modulation (PCM) **4**, 98, 106; **5**, 6; **6**, 60
P x 64 coding standards **4**, 97

Q

Q.931 protocol **3**, 81; **6**, 94
Q.932 protocol **3**, 66
QSA **5**, 56
Quad-link packet switch (QLPS), 5ESS® **6**, 32
Quality assessment **6**, 10, 12
Quality assurance, software (SQA) **1**, 26-33
Quality Assurance Institute **1**, 30, 36
Quality awards: AT&T Chairman's Quality Award (CQA) **1**, 17; **6**, 12 ; Baldrige National Quality Award **1**, 6, 8, 13, 18, 49; **6**, 7, 9, 12; Bell Laboratories President's Quality Award **4**, 80
Quality function deployment (QFD) **1**, 44, 50
Quality in work life **6**, 10, 11
Quality improvement projects (QIP) **6**, 14
Quality Improvement Story (QIS) **1**, 50, 51, 54, 55
Quality improvement teams (QIT) **6**, 9, 65, 67
Quality planning matrix (QPM) **1**, 49, 51, 52, 55
Quality, Engineering, Software and Technologies (QUEST) **1**, 7, 8, 13, 15, 17, 23, 24, 32
Quality, software **1**, 26-33
"Quantum Cascade Semiconductor Laser Invented" **3**, 2
Quarter common intermediate format (QCIF) **4**, 99, 100
Quest **5**, 56

R

Radio frequency (RF) hopping **3**, 15; technology **3**, 15, 104-106; **6**, 56, 58, 59;

Radio frequency *(continued)*
transconductance **2**, 69
Radio interface protocol (RIP), MOBITEX **3**, 16, 19
Radio, passive **3**, 15
Radio ports (RP), cellular **6**, 56, 57
Radio port control unit (RPCU), cellular **6**, 56, 57
Rajaram, S. (Raja) **2**, 77-85
Rake receiver **6**, 58
Rampart protocol toolkit **5**, 37
Ranada, Miguel F. **6**, 62-70
Random-access memory (RAM) **2**, 12, 14, 23, 32, 37; **3**, 59; **5**, 62, 63: fault- and defect-tolerant **2**, 12
Rapid prototyping tools **4**, 16
Rapid-thermal-anneal chemical vapor deposition (RTACVD) **3**, 104
Rattray, Kenneth **3**, 14-20
Reactive-ion-etch (RIE) **3**, 94, 96, 107, 108
Read-only memory **5**, 62, 63
Red Book, CCITT **3**, 21
Redistribution of electronic documents **5**, 73-80
Reeds, Jim **5**, 22
Re-engineering **1**, 5, 12
"Re-engineering Handbook" **1**, 8
Reflowing **3**, 109
Regional Bell operating companies (RBOCs) **3**, 54; **4**, 7
Regular structure BIST generator **2**, 37
Reiter, Mike **5**, 30-39
Relative perceived value **6**, 16
Reliability Review Forum **6**, 67
Reliable Transfer Service Element (RTSE) **3**, 28
Remite Jr., Fred **3**, 46-56
Remittances, validity of **5**, 10, 14
Remote integrated-services line unit (RISLU), 5ESS® **6**, 33
Remote network mediation unit (RNMU) **4**, 64
Remote operations service element (ROSE) **3**, 28, 66-71, 73-78: error macro **3**, 66, 69, 70, 72-75; operation macro **3**, 66-71, 73-78
Remote switching module (RSM) **6**, 31
Remote line groups (RLG), 5ESS® **6**, 33, 36;
Remote line interface, 5ESS® **6**, 32;
Removal efficiency metric **6**, 15
Replay attack **5**, 67
Request for Comments (RFC), Internet **3**, 32
Request for proposal (RFP) **1**, 71
Restructuring process: strategy **1**, 11; feedback **1**, 11; improvement **1**,11; metrics **1**, 11; processes **1**, 11, process owners **1**, 11
Resist-etching integrating **3**, 109
Restoration and Provisioning Integrated Design (RAPID) processor **4**, 11, 69, 70, 72, 74-79
Restoration channel (T3R) **4**, 77
Restoration Node Controllers (RNC) **4**, 70, 72-76, 78-80
Restoration test equipment (RTE) **4**, 70-73, 75, 76, 78
Reticles **3**, 94
Reverse engineering **4**, 40
Reverse-via processing **3**, 108
RFC 1421-1424 Privacy Enhanced Mail (PEM) **3**, 36; 1463 Post Office Protocol (POP) **3**, 36
Right to privacy **5**, 5
Rink, Randal M. **6**, 62-70
Risk instruction set computing (RISC) **3**, 16
Risks to the General Public Forum **5**, 44, 45
Rivest, Ron **5**, 20, 21, 49
RNC element management system (RNC-EMS) **4**, 78
Roamers and encoding **5**, 22
Robb, Sen. Charles S. **5**, 5
Robust design (SSRD) **1**, 48-58: and AT&T Transmission Systems Business Unit (TSBU) **1**, 48-58
Robust digital design team (RDDT) **1**, 53, 54, 55
Robust physical design team (RPDT) **1**, 53, 54, 55
Robust testing **4**, 24, 25
Rommel, General **5**, 5
Roosevelt, President **5**, 17
Root node, threat tree **5**, 42
Root cause analysis (RCA) **4**, 42; **6**, 7, 11-15, 17: Best Current Practices Handbook **6**, 12
Rotella, Joseph P. **4**, 14-21
Routing, switching **6**, 87, 88
Roy, Radhika **4**, 97-108; **6**, 81-92
RSA algorithm **3**, 9, 10, 37: Algorithm Message Digest 2 and 5 **3**, 37: cryptosystem **5**, 19, 20, 21, 31, 36, 49, 58
RTT, *see* BELGACOM
Rule-based programming **1**, 69
RUNBIST **2**, 43
Rutkowski, Paul W. **2**, 30-39

S

SABLIME® **1**, 65-67; **4**, 42
Satellites, low Earth orbit (LEO) **3**, 16
SatWatch **5**, 57
Scanners **5**, 74
Scene changes, automatic detection **2**, 2
Scheerer, William G. **1**, 4-5
Schlumberger S760-series test set **2**, 52
Scratch probing **2**, 46
Screen pops **4**, 92
Scribner, Neal **4**, 29-34
Scripts **4**, 53
SCUBA synthesis system **6**, 2
Secure Communications Systems Business Unit (SCSBU) **5**, 6: Development Laboratory **5**, 12
Secure Hash Algorithm (SHA) **3**, 12; **5**, 13, 36
"Secure Network Access Using Multiple Applications of AT&T's Smart Card" **5**, 61-72
Secure Systems Engineering Department **5**, 43, 52, 54, 58
Security application module (SAM) **5**, 67
"Security in Electronic Messaging Systems" **3**, 7-13
"Security Technologies" **5**, 4-8
Security: access **5**, 46, 47; architecture **5**, 49, 50; and AT&T Communications **5**, 6; applications procedures **5**, 46; auditing **5**, 46, 47, 50; authentication **5**, 46, 47; Basic Security Option (BSO) **5**, 58; Common IP Security Option (CIPSO) **5**, 58; of communications **5**, entire issue; computer **5**, 40-51; Congressional hearings **5**, 6; COPS security package **5**, 56; countermeasures **5**, 46; crack password security **5**, 56; customers' premises **5**, 5; Databaseless Security System **5**, 67; of distributed system interfaces and services **5**, 30-39; of electronic messaging **3**, 7-13; Electronic transactions **5**, 6, 9; intrusion detection **5**, 46-48; local and interexchange **5**, 5; loop plant **5**, 5; mechanisms **5**, 46; in messaging authentication **3**, 10; **3**, 7-13; policy **5**, 46, 47; of multimedia conferencing **4**, 97-108; network **5**, 40-51; NetWatch™ network **5**, 52-60; reference monitor **5**, 47; resources **5**, 53; **6**, 6; safeguards **5**, 46; security concept **5**, 30-39; services **4**, 5; solution integration **5**, 49, 50; system **5**, 40-51, 52-60; system security engineering (SEE) **5**, 40-51; teleconferencing, security of **5**, 6, 9; telecollaboration, telepublishing, and telecommumication **5**, 6, 9; tiger team **5**, 43; transparent mistrust, concept of **5**, 7: Trusted Security Gateway **5**, 58; trusted computing base (TCB) **5**, 46, 48
Self-aligned silicide (SALICIDE) **3**, 97
Self-loops, consecutive **2**, 25
Semiconductor materials and services, optical techniques for characterizing **2**, 66-76
Semiconductors, III-V **2**, 30, 66, 69, 70, 72, 75; **3**, 94; organic **5**, 2
Sequential circuits **2**, 19-22
Service Circuit Platform, 4ESS™ switch **6**, 94, 98, 99
Service circuit node (SCN) **6**, 43
Service control point (SCP) **6**, 41-44
Service creation environment (SCE) **6**, 41-44
Service failure verification (SFV) **4**, 71, 73
Service management system (SMS) **6**, 51, 42-44
Service processing logic and control **6**, 42, 44
"Service Processing Systems for AT&T's Intelligent Network" **6**, 39-47
Service provisioning **6**, 6

Service nodes (SN) in intelligent networks (IN) **6**, 41-43
Service switching point (SSP) **6**, 41-43
Service verification (SV) **4**, 71-73
Services: 700 single number reach **6**, 39, 41; 800 **3**, 48-55; 800 speech recognition **6**, 45; **4**, 96; 900 **6**, 19, 41, 45; Accunet® Packet Service **4**, 70; Advanced mobile phone service (AMPS) **3**, 17; **6**, 6, 55, 58; Air-to-Ground **3**, 55; AT&T Message **3**, 4, 6, 46-56; automated operators **6**, 45; call forwarding and call rejection **6**, 45; call waiting plus **6**, 45; customers' premises **5**, 5; EasyLink® Service **3**, 19; electronic mail **5**, 41; in intelligent networks (IN) **6**, 39, 41, 41, 44-46; InterSpan **6**, 54; message handling services (MHS) **3**, 6, 66; messaging **6**, 41; multimedia conferencing **4**, 97-108; personal communications services (PCS) **3**, 14-20; **6**, 6, 19, 39, 41, 45; personal number calling **6**, 45; personal number portability **6**, 39; store-and-forward **6**, 41; True Messaging **3**, 46; telephone relay service (TRS) **6**, 46; USA Direct **3**, 48, 55; virtual private network **4**, 5; voice dialing **6**, 41; wireless **3**, 17-19 (*see also* AUDIX® and DEFINITY®)
Session keys **5**, 35
Shamir, Adi **5**, 20, 21, 49
Shared risk link group (SRLG) **4**, 80
Shared secrets **5**, 22
Sharp, Ronald L. **5**, 52-60
Sherman, Stephen A. **5**, 61-72
Shinners, Stephen P. **3**, 46-56
Siemans **4**, 56
Siemans EWSD **4**, 62,
Sig Salley Secrecy System **5**, 6
"Signal Sequence Editing Method and Apparatus with Automatic Timefitting of Edited Segments" **4**, 3
Signaling System 7 (SS7) **3**, 66, 76, 80, 81; **4**, 5, 10, 32, 62, 65; **6**, 40, 41, 43
Signal transfer point (STP) **6**, 41-43
Signature keys **5**, 35
Signature: certificates **5**, 31; comparison **5**, 69
Siil, Karl A. **5**, 24-29
Silicon (SI) technology **3**, 94
Silicon Graphics Indigo* R4000 Workstation **3**, 3
Silicon Nails **2**, 60
Silicon nitride **3**, 100, 102
Silicon oxynitrides **3**, 100-102
Silicon-on-insulator (SOI) **2**, 66, 72, 74, 75
Silicon wafer mapping **2**, 72-75
Silver Bullet **4**, 7, 35-45
"Silver Bullet: An Iterative Model for Process Definition and Improvement" **4**, 35-45
SIMOX (separation by implantation of oxygen in SOI) **2**, 74
Simple mail transport protocol (SMTP) **3**, 32, 34, 36, 38 41, 42
Simple network management protocol (SNMP) **3**, 42; **4**, 12, 47, 88-96: Version 2 (V2) **4**, 90, 92; **6**, 49
Simplified message service interface **6**, 44
Simplified Message Set Interface, DEFINITY® AUDIX® **3**, 59
Sinclair, Timothy K. **2**, 56-65
Single-key encryption **5**, 48, 49
Six-Sigma Quality **1**, 49, 50-52, 54, 55
Six-Sigma Robust Design **1**, 48-58
Skibo, Richard **5**, 61-72
Skynet® Clearlink Service network **4**, 70-72, 75, 76, 78
SLC®-2000, and PROSE **1**, 79
Small computer system interface (SCSI) **3**, 58, 59
Smart Card, AT&T **5**, 7, 8, 61-72
Smart cards **5**, 7, 8, 31, 33, 34, 47: escrowed **5**, 33
SMARTsystem **1**, 65, 66
Smith, Mark E. **5**, 52-60
SNA protocol **5**, 52
Sneed, E. Lee **6**, 19-27
Software development environment (SDE) **1**, 59, 64-67; **4**, 37
Software Engineering Institute (SEI) Capability-Maturity-Model 2 **1**, 26, 28, 29, 33
Software Engineering Institute for ARPA **5**, 56: Capability Maturity Model 2 **1**, 26, 28, 29, 33
Software fault tolerance **4**, 5
"Software Production: From Art/Craft to Engineering" **1**, 59-68
Software quality assurance (SQA) **1**, 26-33
Software quality assurance plan (SQAP) **1**, 27, 28, 30, 31
Software reliability engineering (SRE) **4**, 22-28, 73, 74, 76
Software Technology Center (STC) **4**, 35, 37, 44
Software Through Pictures* **4**, 24
Software-driven terminals for windows **4**, 5
Solder bump bonding **6**, 71
Solution engineering **1**, 14
SONET: and 4ESS™ switch **6**, 97; and 5ESS® switch **6**, 32; /SDH Digital Networking Unit- (DNU-S) **6**, 32, 36
Spacer **3**, 108
Spain, and Pan-European Network **6**, 52-53
Spatially resolved photoluminescence (SRPL) **2**, 66-68, 70-72, 74, 75
Speakeasy identification **5**, 11
Special network accessibility platform (SNAP) **6**, 46
Spectrum* **4**, 92, 95
Speech encoding, CLEP + **2**, 3
Speech recognition: automatic (ASR) **6**, 44-46; directory assistance preprocessor **3**, 3; speech synthesis, from text detection **2**, 2
Spin on glass (SOG) spin cast **3**, 94, 96, 98, 99, 102, 104, 110
Spread spectrum **3**, 15; **6**, 58: direct-sequence **3**, 15; frequency hopping **3**, 15;
Sprint, and FTS-2000 **3**, 22
"SQA-A Proactive Approach to Assuring Software Quality" **1**, 26-33
SRI International **5**, 45
Stability test **4**, 76
Stability runs, 5ESS® **6**, 35
Standards, ANSI (*see* ANSI)
Standards, CCITT (*see* CCITT)
Standards, evolution of messaging **3**, 21-45
Standards, IEEE (*see* IEEE)
Standards, Internet (*see* Internet)
Standards, ISO (*see* International Organization for Standards)
Standards, *P x* 64 coding **4**, 97
Stanford University **5**, 19
Stanzione, Dan **4**, 4-13
Star Wars **5**, 40
StarKeeper® II NMS (Network Management System) **4**, 11, 46-55: and BELGACOM **4**, 64-66; Graphics System **4**, 47-50, 52; network architecture, Graphics System, Network Monitor **4**, 47, 48, 49, 52-54; network architecture, Graphics System, Network Builder **4**, 46, 48, 49, 52, 53; network architecture **4**, 46; network architecture, Core System **4**, 47, 49-52, 54; network architecture, Graphics System, Performance Reporter **4**, 48, 49; Performance Monitor **4**, 46, 53; Programmer's Interface (PI) **4**, 52
"StarKeeper® II NMS—Management of a Cell Relay Network" **4**, 46-55
StarLAN® **3**, 46, 51
StarSentry system™ **4**, 92: and BELGACOM **4**, 64-66;
Star Server® FT **4**, 67
State machine replication **5**, 37
Static random-access memory (SRAM) **2**, 34; **3**, 98
Static testing **2**, 83
Stecher, Lee C. **6**, 28-38
Stelte, David J. **6**, 28-38
Step-coverage **3**, 97
Stoll, Cliff **5**, 40
Strategic quality planning **6**, 10, 11
Strategy, levels of **1**, 10, 11
Stress test **4**, 76
Stress testing, environmental **2**, 77-85
Stroud, Charles E. **2**, 10-18

Structured analysis **4**, 24: security **5**, 40, 41
Structured design **4**, 24: reviews **4**, 16
Structured query language (SQL) **4**, 51, 53
STU-III secure telephone **5**, 6
"Stuck-at" faults/defects **2**, 8, 10, 11, 20, 30; model **2**, 20
Subassemblies and systems boundary-scan testing **2**, 40-48
Subdedicated files (SF) **5**, 65
Subscriber loop carrier, and switching **6**, 23 (*see also* SLC® systems)
Substitution cipher **5**, 25, 26, 28
Sun Microsystems* **2**, 77; **4**, 30: 690 **1**, 75; calendar manager **1**, 65, 66: Open Windows* **4**, 19: SunNet Manager* **4**, 92
Supercomm '90 **6**, 75
"Surface-Mount Transformers for Power-Conversion Products" **1**, 3
Surface mounting, fine-pitch **2**, 47
Surface-mount device (SMD) **2**, 60, 61
Surface-mount technology **2**, 8, 56-65; **6**, 63
Surity™ Data Network System **5**, 58; 3600 secure telephone **5**, 20
Sweden, and Pan-European Network **6**, 52-53
swIPe Internet protocol (IP) **5**, 34
Swiss securities clearinghouses **5**, 11
Switch Communications Interface (SCI) **3**, 61
Switch-control software, architectures of **4**, 2, 3
Switched Access Remote Test System/Remote Measurement System-International (SARTS/RMS-1) **4**, 60, 67
Switched Multi-megabit Data Service (SMDS)* **4**, 11, 46; **6**, 26, 48; comparison with other technologies **6**, 89-91
Switches (*see* 4ESS™, 5ESS®, asynchronous transfer mode (ATM), cellular, DEFINITY®, Dimension®, System 75/85, *and* Switching)
Switching: fabric platform of 4ESS™ switch **6**, 94; broadband **6**, 6, 71-80; architecture forms **6**, 21-23; cellular **6**, 6; comparison of technnologies **6**, 89-91; control fabric interface continuum (CFI) **6**, 21, 23, 24; distributed architecture trends and concepts **6**, 19-27; "nail up" switching **6**, 32; photonic **6**, 6, 71-80; symmetrical cryptosystems, **5**, 35; variable bandwidth **6**, 32; wireless with 5ESS® **6**, 6
Switching Control Center System (SCCS) **4**, 32
Switching modules (SM), 5ESS® **6**, 32, 34, 36, 37
Switching Systems Business Unit (SSBU), and Total Quality Management **6**, 7-18
Switching Systems, and RUNBIST **2**, 43
Switching, an overview **6**, 4-6; **6** (entire issue); (*see also* Asynchronous transfer mode (ATM), Synchronous transfer mode (STM), and Cellular)
Symmetric self electro-optic effect device (S-SEED) **6**, 75-76
Synchronization: intermedia **6**, 86; intramedia **6**, 86
Synchronous digital hierarchy (SDH) **4**, 9, 57; **6**, 26; and 5ESS® switch **6**, 32; SONET/SDH Digital Networking Unit-(DNU-S) **6**, 32, 36
Synchronous optical network (SONET) **4**, 33; **6**, 26
Synchronous transfer mode (STM) **6**, 20, 26, 81; -ATM conversion **6**, 51, 52, 91; comparison with other technologies **6**, 89-91
SYRAR multiplexers **4**, 59, 60, 64
System 3, photonic **6**, 75; System 4 **6**, 75, 76; System 5 **6**, 77, 79
System 75 PBX **3**, 61; **4**, 12, 83, 85
System 85 PBX **4**, 83, 85
System Access Terminal (SAT) **4**, 12, 83, 84
System security engineering (SSE) **5**, 40-51
System V/MLS operating system **5**, 52, 53, 57, 58
System V/MLS operating system, AT&T **5**, 52, 53, 57, 58
System-weighted penalty (SWP) **5**, 43, 45, 46
Systems and subassemblies boundary-scan testing **2**, 40-48
"Systems Management in the 1990s" **4**, 82-96

T

TA-NPL-000145, TA-NPL-001412, TA-TSV-001411 (Bellcore) **6**, 57
T testing tool **4**, 43, 44
T-aspects, six steps of technology insertion **1**, 60-64
T=0, T=1 protocols **5**, 63
T1 facilities **5**, 5
Talk through **6**, 45
Tagging (ASN.1) **3**, 82, 83
Taguchi Method **1**, 50, 53, 54
Tandy Zoomer* **3**, 17
Tantalum oxide dialectrics **3**, 96
Tapdance® **2**, 37, 38, 42
Tarbox, Richard A. **2**, 4-9
Task definition **4**, 38
TCP/IP network **4**, 30, 67, 68, 90, 94; **5**, 52
"Technique for Drawing Directed Graphs" **2**, 3
Technologies: access **3**, 19; enabling **1**, entire issue; electronic **2**, entire issue; of the messaging market **3**, 4-7; overview of enabling **1**, 4, 5
Technology: insertion **1**, 59-64; introduction plan **4**, 40, 42-44; wireless **3**, 19
Teflon*-encapsulated Viton* **3**, 107
Telecollaboration, security of **5**, 6, 9
Telecom 1992 **6**, 72
Telecommunications devices for the deaf (TDD) **6**, 45
Telecommunications management system (TMS) **4**, 60
Telecommunications Industry Association (TIA) **5**, 22
Telecommunications Management Network (TMN) **3**, 31, 42; **4**, 62, 64; **6**, 49
Telecommunications Network Management (of ITU) **3**, 31
Telecommunications network management (TNM) **4**, 10, 57
Telecommunications, and ATM **6**, 20
Telecommuting, security of **5**, 6, 9
Telefonica of Spain **6**, 68: Tres Cantos plant **6**, 68
Telemetry asynchronous block serial (TABS) protocol, AT&T **4**, 64
Telephone company engineered **1**, 75
Telephone, STU-III **5**, 6
Telephone relay service (TRS) **6**, 46
Telepublishing, security of **5**, 6, 9
Telescript* script language **3**, 18
Television: cable **5**, 12; high definition (HDTV) **6**, 85; interactive **5**, 30-39; on demand **4**, 5; pay-per-view **5**, 11, 12
Telnet **4**, 90; **5**, 53, 58
Teradyne*: Safecracker* **2**, 58; A500 test set **2**, 51
Test: access port **2**, 40-44, 60; bed-of-nails access **2**, 56, 57; controller **2**, 31; destruct test limit **2**, 82; executive **4**, 27; pad access **2**, 57; pattern generator **2**, 15, 31-34; signal identification (TSID) **4**, 70, 73; stability **4**, 76; Z1860 test set **6**, 66
Test strategies: divide and conquer **2**, 31; hierarchical **2**, 31
Tester, in-circuit **2**, 40
"Testing Goes Critical Path" **2**, 4-9
Testing: 5ESS® **6**, 34; accelerated **2**, 78; analog **2**, 7, 8; for best-in-class **2**, 10; **6**, 11; built-in self-test for integrated circuits **2**, 30-39; burn-in **2**, 12, 80; cluster **2**, 41; design-for-test in analog, digital domains **2**, 49-55; dynamic **2**, 83; digital electronic circuits **2**, 19-29; environmental stress **2**, 12, 46, 77-85; electronic subassemblies and systems **2**, 40-48; full scan **2**, 25; GENTEST test generator **2**, 7, 8, 19, 21-24; high-density SMT circuit packs **2**, 56-65; $I/_{DDQ}$ testing **2**, 28; implication in **2**, 20; in-circuit **2**, 40, 41, 56, 59, 60, 61-63; in-process **2**, 26, 27; integrated **2**, 5; 6, 66, 67; just-in-time **2**, 26, 27; justification in **2**, 20; mixed signal **2**, 11, 14, 49-55; mixed signal testing standard IEEE P1149.4 **2**, 51, 54; off-line (out-of-service) **2**, 13; observability in **2**, 15; on-line (in-service) **2**, 13; partial scan testing **2**, 19,20, 24-27; passive **2**, 83; random logic **2**, 13; RAPID **4**, 76; robust **4**, 24, 25; static **2**, 83; stress **4**, 77-85;

Testing: *(continued)*
T testing tool **4**, 43, 44; trends in digital device test methodologies **2**, 10-18
Texas Instruments, Baldrige winner **1**, 49
"Text-to-Speech Synthesis Applied to Voice-Mail Conversion" **2**, 2
"The 5ESS®-2000 Switch: Exceeding Customer Expectations" **6**, 28-38
"The BINOC Project: A Milestone for the Operations Systems Business of AT&T," **4**, 56-68
"The Evolution of the 4ESS™ Switch" **6**, 93-100
"The Cuckoo's Egg" **5**, 40
Thin films **3**, 94
Threads **4**, 42
Threat tree **5**, 7, 41, 42
TickIT, ISO certification **6**, 12
Tiger team, security **5**, 43
Time-division multiple access (TDMA) **6**, 58, 59
Time-division multiplexing (TDM): **6**, 55, 59; DEFINITY® **3**, 57, 58, 60
Time multiplexed switch, 4ESS™ switch **6**, 94, 97, 98
Time scale modifications **3**, 62
Time slot interchanger (TSI): 4ESS™ switch **6**, 94, 97; 5ESS® expanded **6**, 30, 34, 60
Time slot interchange unit (TSIU), 5ESS® **6**, 34; 4ESS™ switch **6**, 94, 97
Time-Warner **6**, 53
Times Fax **5**, 73
Token, smart card **5**, 61
TOPAS-ES **4**, 19
Total network management (TNM) **4**, 32: integration module (TIM) **4**, 64, 65, 67
Total Network Surveillance (TNS) **4**, 6
Total Quality Approach **1**, 9
Total Quality Control/Just-in-Time (TQC/JIT) **6**, 68
Total quality management (TQM) **1**, 7, 9, 13, 17; **6**, 5, 7-18
"Total Quality Management in the Switching Systems Business Unit" **6**, 7-18
Touchtone detection, **3**, 62
Traffic characteristics **6**, 85-86: average **6**, 85; peak **6**, 85; variance **6**, 85
Transaction capabilities (TC) **3**, 66, 76-77
Transaction classes **4**, 26, 27
Transformers, surface-mount **1**, 3
Transistor cascade, photonic chip **6**, 73
Transmission control protocol/Internet protocol (TCP/IP) **3**, 23, 32
Transmission electron microscopy **2**, 69, 74
Transmission equipment (*see* DACS, DDM, FT, SLC®)
Transmission means (MT) **4**, 62
Transmission supervision (TM-SUP), BINOC **4**, 57, 58, 60
Transmission Systems Business Unit (TSBU): and ISO 9000 and APEX Transmission Systems Business Unit **1**, 17-25; and quality planning matrix (QPM) **1**, 51, 52; and robust design **1**, 48-58; and RUNBIST **2**, 43
Transparent mistrust **5**, 7: security concept **5**, 30-39
Transport Maintenance Platform (TMP) **4**, 70, 71, 72, 74, 77, 78
Transport Service Center **4**, 78, 80
Transport Service NOW (TSNOW) platform **4**, 70, 71, 79
TransVu **4**, 57, 65: -2000 **4**, 60, 62, 65, 66, 68
Trapdoors, encryption **5**, 18
Trasys Corporation **4**, 59, 62
"Trends in Digital Device Test Methodologies" **2**, 10-18
Treventi, Phil **5**, 22
troff **5**, 78
Trouble Tracker **4**, 87, 88, 89, 94, 95
Truck-bomb computer attack **5**, 48
True Messaging, AT&T **3**, 46
True Messages **3**, 46
Trust: boundaries **5**, 31; domains **5**, 54
"Trust in the New Information Age" **5**, 9-16
Trusted computing base (TCB) **5**, 46, 48
Trusted Path, System V/MLS **5**, 53
Trusted systems **3**, 10, 11; design assurance **3**, 10, 11; service functionality **3**, 10, 11
Trustworthy systems **5**, 30-39
TTI-Testtron Ultra-Lign* test probe **2**, 58
Tulloss, Rodham E. **2**, 40-48
TUXEDO **4**, 67

U

"U.S. ADMD Behavior Guidelines" **3**, 27
U.S. Department of State **3**, 27
U.S. Orange Book **3**, 11, 12
ULSI dielectic materials **3**, 94-111
Undoped oxides **3**, 97, 99
Undoped silicon dioxide **3**, 99, 101
UNICAD/IDS **2**, 62
United Kingdom, and voice technology **6**, 45; and Pan-European Network **6**, 52-53
United Nations, and ITU **3**, 21
United States, and voice technology **6**, 45
UNIX* Systems Laboratories, Inc. **4**, 50, 66, 88
UNIX* operating system **4**, 4, 5, 9, 30, 50, 51, 66, 67, 73, 88; **5**, 32, 43, 44, 56: kernel **5**, 52; permissions vector **5**, 47; System V, Release 4 **3**, 58; -based DORA2 **2**, 62, 63
Unshielded twisted pair (UTP) **4**, 97
USA Direct Service **3**, 48, 55
Urban, Michael J. **6**, 7-18
Usability engineering process **4**, 15, 20
Usability engineering testing **4**, 18
Usability testing **4**, 16
USENET **5**, 56
User-based isolation **5**, 59
UX operating system **4**, 66, 68

V

V32MX AT&T modem chip **3**, 16, 17
Vacuum-compressed-ring (VCR) **3**, 107
Validation **5**, 66, 67; servers **3**, 48
Validity of remittances **5**, 10, 14
Value maps **6**, 16, 17
Variable bandwidth switching **6**, 32
Variable bit rate (VBR) **4**, 98, 100, 101, 105-107; **6**, 90
VDH* Corporation **4**, 67
Vernam cypher **5**, 6, 17, 18
Very compact digital exchange (VCDX), 5ESS® **6**, 32
V-groove component mounting, photonics **6**, 75
Via access **2**, 57
VIACOM **6**, 53
Video cassette recorder (VCR) **6**, 83, 84
Video conferencing, and ATMs **4**, 97-108; **6**, 82-86, 88-91
Video-on-demand **4**, 5; **5**, 12; **6**, 82, 84-86
Virtual circuit (VC) **4**, 103
Virtual path (VP) **4**, 103
Virtual private network (VPN) services **4**, 5; **6**, 41
VLSI: dielectic materials **3**, 94-111; technology **3**, 57
VMEbus system **4**, 66
VMEexec **4**, 66
Vo, K. P. **2**, 3
Vogel Jr., W. C. **6**, 15, 17
Voice mail, AUDIX® and DEFINITY® system **3**, 4-6, 57-65
Voice message protocol P/voice (P/40) **3**, 29
"Voice Messaging for DEFINITY® System Customers Around the World–the DEFINITY® AUDIX® Voice Mail System" **3**, 57-65
Voice messaging, editing **4**, 3
Voice prints **5**, 69
Voice recognition call processor (VRCP) **6**, 43; and automated operators **6**, 45
Voice template **5**, 69
Voice-sample buffers **5**, 12
VUE* **4**, 19
VXIbus (VMEbus extended for instrumentation) **2**, 52, 53

W

Wafer mapping, III-IV **2**, 69-72
Warty, Pramod **4**, 28
Washington-Moscow hotline **5**, 18
WaveLAN® **3**, 15
Wavelength division multiplexing **6**, 3
Weinman Jr., Joseph B. **1**, 6-16

Weinstein, Arthur **4**, 46-55
Wesner, John **1**, 34-47
White House, and encryption **5**, 6, 17
Wide area network (WAN) **4**, 83, 91, 92, 104; **5**, 52, 53; **6**, 48, 50
Wilder, Gov. Lawrence D. **5**, 5
Wilkes, Joseph E. **3**, 7-13
Wilks, A. R. **1**, 3
Wilson, Elizabeth A. **4**, 46-55
Wilson, Randall J. **6**, 55-61
Windows* **4**, 86, 88, 89
Windows* NT,* Microsoft **5**, 47, 53
Wireless: and 5ESS® switch **6**, 55-61; access **6**, 19, 20; computing **3**, 17; devices **3**, 16, 17, 19; LANs, **3**, 14, 16, 18, 19; messaging architectures **3**, 14; messaging services **3**, 17-19; modem elements, **3**, 17; networks **5**, 34; services **3**, 17-19; switching **6**, 6; technology **3**, 14-16, 19
"Wireless Messaging" **3**, 14-20
Wiretapping **5**, 5
Wizards **4**, 19
Word-space encoding **5**, 77, 78
Word spotting **6**, 45
Work Management System (WMS) **4**, 23
World War II **5**, 4, 5
Worldwide Web **5**, 73
Wright, Jon R. **1**, 69-80
Wu, Shianling **2**, 10-18, 30-39

X

X terminals **4**, 49, 50; **5**, 58, 59
X, design for, **1**, 34-40: and concurrent engineering **1**, 43
X-windows/Motif **4**, 66
X.25 data network **3**, 21, 43, 57, 61
X.400: access unit (AU) **3**, 23; administrative management domains (ADMD) **3**, 25, 26, 27, 40; Application Program Interface (API) Association **3**, 43; Common Message Call Application Program Interface (API) **3**, 43; F.402 annex D **3**, 31; F.420 annex E **3**, 31; F.435 annex C **3**, 31; F.435 annex I **3**, 31; F.440 **3**, 31; F.440 annex G **3**, 31; and Internet standards, body part support **3**, 40-43; and Internet standards, compared **3**, 40-43; message format **3**, 25, 26; message store (MS) **3**, 23, 24; message transfer agent (MTA) **3**, 23-24, 27, 28; notification message **3**, 25; originator/recipient (OR) address **3**, 26; physical delivery service (PDS) **3**, 24; private management domains (PRMD) **3**, 25, 26, 27; probe message **3**, 25; Recommendation D.36 **3**, 40; recommendation F.401 **3**, 26; Recommendation X.420 **3**, 30; remote user agent **3**, 24; standards, evolution of **3**, 21-45; user agent (UA) **3**, 23; X.400, access unit (AU) **3**, 23; X.400-1984 **3**, 22, 23, 27; X.400-1988 **3**, 22, 23, 25-28, 30; X.400-1992 **3**, 22, 23, 25, 27, 30; X.400-1994 **3**, 28; X.402 **3**, 27; X.411 **3**, 25, 27; X.413 **3**, 24; X.419 **3**, 24; X.420 **3**, 28; X.435 **3**, 28; X.440 **3**, 28; X.445 **3**, 43; X.460 **3**, 31; X.463 **3**, 31; X.464 **3**, 32; X.470 **3**, 31
X.500: Directory **3**, 27; Recommendations **3**, 34
X/OPEN* Corporation **5**, 32, 43, 52: X/OPEN* **3**, 43
XIM interface **4**, 67, 68
Xunet testbed **4**, 2, 3

Y

Yamamoto, Admiral **5**, 4
Yaniro Jr., Daniel J. **3**, 46-56
Yanizeski, George M. **1**, 48-58
Yau, Chi W. **2**, 40-48
"You Will" AT&T commercials **6**, 81

Z

"Zelig" **5**, 15
Zorian, Yervant **2**, 30-39

THIS PERIODICAL MIGHT BE COPYRIGHTED, IN
WHICH CASE THE CONTENTS REMAIN THE PROPERTY
OF THE COPYRIGHT OWNER. THE MICROFORM
EDITION IS REPRODUCED BY AGREEMENT WITH
THE PUBLISHER. DUPLICATION OR RESALE WITHOUT
PERMISSION IS PROHIBITED.

UNIVERSITY MICROFILMS INTERNATIONAL
ANN ARBOR, MICHIGAN

INDEX NOTICE

TO MAKE THIS MICROFILM AVAILABLE AT AN EARLY DATE, IT HAS BEEN RELEASED WITHOUT AN INDEX. SHOULD AN INDEX BE PUBLISHED IN THE FUTURE, IT WILL BE INCLUDED IN THE MICROFILM VOLUME WITH WHICH IT IS RECEIVED.